The Development of a Backfill Analysis Tool in the Army's Great Plains Regional Medical Command

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The purpose of this study was to analyze backfill and PROFIS tasking data from fiscal year 2001 and develop a methodology to estimate costs associated with backfill missions within GPRMC, which then could be adequately resourced. The future arrival in fiscal year 2004 of the next generation of TRICARE Managed Care Support Contracts (TNEX), and the subsequent major financial structural modifications in TNEX will drastically increase a commander’s exposure to financial risk. A clear understanding of the nuances and relationships between financing and Military Healthcare System (MHS) unique readiness issues is needed to assist the GPRMC commander in executing the soundest financial decisions possible. The resulting process, coined the Backfill Analysis Tool (BAT), provides a comparative view of expected travel costs in conjunction with TRICARE Prime leakage to the network; facilitating a holistic financial comparison. The results of the study indicate that two of five real-world taskings under study could have been supported with reduced costs to the region. The BAT process provides GPRMC staff the opportunity to routinely factor in leakage costs into the backfill decisionmaking process.

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Abstract

The purpose of this study was to analyze backfill and PROFIS tasking data from fiscal year 2001 and develop a methodology to estimate costs associated with backfill missions within GPRMC, which then could be adequately resourced. The future arrival in fiscal year 2004 of the next generation of TRICARE Managed Care Support Contracts (TNEX), and the subsequent major financial structural modifications in TNEX will drastically increase a commander's exposure to financial risk. A clear understanding of the nuances and relationships between financing and Military Healthcare System (MHS) unique readiness issues is needed to assist the GPRMC commander in executing the soundest financial decisions possible.

The resulting process, coined the Backfill Analysis Tool (BAT), provides a comparative view of expected travel costs in conjunction with TRICARE Prime leakage to the network; facilitating a holistic financial comparison. The results of the study indicate that two of five real-world taskings under study could have been supported with reduced costs to the region. The BAT process provides GPRMC staff the opportunity to routinely factor in leakage costs into the backfill decision-making process.

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The Development of a Backfill Analysis Tool in the Army's Great Plains Regional Medical Command

Introduction

The Great Plains Regional Medical Command (GPRMC) is located in San Antonio, Texas on Fort Sam Houston. The GPRMC supervises the activities of 10 Army Military Treatment Facilities (MTF) spread out over 16 States. Appendix A illustrates the enormous area of responsibility for which the commander of GPRMC, Brigadier General Daniel F. Perugini, is responsible. GPRMC is a subordinate command to the United States Army Medical Command (MEDCOM). Appendix B contains an organizational chart that depicts GPRMC's placement and the Army installations on which all MTFs within the region reside. This organization is part of a highly complex healthcare system, one in which events confound and complicate the management of the region. The GPRMC serves in a management and leadership role for the MTFs and thus is responsible for analyzing problems, requirements, allocating resources, and assessing performance across the region.

Financially, the region's day-to-day operations are significant. In fiscal year 2001 (October 1, 2000 through September 30, 2001), the MTFs within GPRMC expended over $604 million on healthcare and support activities and $2.169 million was spent daily on the direct care of our beneficiaries (Great

Plains Regional Medical Command Budget Office, 2002).

The 10 MTFs comprising GPRMC's medical capability vary in size and complexity. The region can be stratified into three major subgroups for the purposes of this study. The region's three large facilities constitute the first grouping. These facilities offer a full range of inpatient and outpatient services as well as supporting large Graduate Medical Education (GME) programs. Physicians obtain specialized training beyond medical school through GME. This first grouping includes two medical centers and one large community hospital. The five remaining Army Community Hospitals constitute the second grouping. The Army Community Hospital is the most common type of facility in GPRMC. These community hospitals provide limited inpatient services and full outpatient services. The mix and robustness of the inpatient services is driven by population needs and force structure constraints. Two Army Health Centers, capable of only outpatient services, round out the regional structure.

GPRMC employs over 11,500 personnel, to include contract workers. There are 761 beds in the region. GPRMC provides cradle to grave health care to over 600,000 beneficiaries. A typical day in the region reveals 112 admissions, 372 occupied beds, 20 live births, 183 surgical procedures, 9,448 outpatient encounters, and 15,034 ordered prescriptions (Great Plains

Regional Medical Command, 2001).

Simply put, GPRMC's daily operations are massive, requiring a clear vision of the future and an appreciation for the forces acting upon it.

Conditions Which Prompted The Study

The circumstance under which this study is being conducted is a confluence of numerous factors. The Chief of Managed Care at GPRMC, Major Timothy Edman, identified the future arrival in fiscal year 2004 of the next generation of TRICARE Managed Care Support Contracts (TNEX), and the subsequent major financial structural modifications as an issue that needed to be studied and analyzed in detail (Timothy Edman, Personal Communication, July 24, 2002). TNEX will drastically increase a commander's exposure to financial risk. A clear understanding of the nuances and relationships between financing and Military Healthcare System (MHS) unique readiness issues is needed to assist the GPRMC commander in executing the soundest financial decisions possible.

GPRMC like all regional medical commands deals with temporary physician loss on a daily basis. Requirements for military readiness often drive the volatility through removal of physicians for Professional Filler System (PROFIS) taskings, backfill taskings (temporary reassignment of physicians to replace another lost physician), and augmentation (augmenting facilities capabilities on a temporary basis). For the purposes of this study, backfill is used in its common usage form and doesn't refer to any specific category of service member. PROFIS providers are active duty physicians working in the region's MTFs who are aligned against active duty and reserve Forces Command (FORSCOM) deployable field medical unit positions. These units are minimally manned and require augmentation to stand-up and deploy. When these units train and or deploy, the PROFIS personnel are required to be available. The degree to which this need is predictable relies heavily on the requesting FORSCOM unit. Additionally, real-world demands often require MTF commanders to react by deploying their PROFIS physicians and then providing healthcare under crisis management with less than optimal staffing. This reality alone is significant enough to develop a dependable decision support system to successfully assist the GPRMC in this ever-shifting environment.

The Military Healthcare System (MHS) and GPRMC compare most easily, although be it strained, with a highly integrated healthcare delivery system described in *Essentials of Managed Health* Care. These systems (highly integrated delivery systems) must either own or contract with three or more components of health care delivery, including at least one physician component…and at least one other component (home healthcare, nursing home, or surgery center) (Kongstvedt, 2001). The MHS owns its surgery centers and physicians. The MHS literally provides every facet of healthcare. Like other highly integrated healthcare systems, GPRMC MTFs provide the majority of the care directly. Integrated healthcare delivery systems achieve efficiencies by providing as much care as possible within the organization. Likewise, this technique is the most cost effective way for the Army to care for its population. Yet, the comparison between the MHS and civilian healthcare organizations is strained upon further examination due to the unique forces, specifically readiness, at play in the MHS.

The MHS and GPRMC are unable to provide all the care needed for our eligible beneficiaries because of force structure, as well as fiscal constraints. The MHS operated approximately 100 hospitals and more than 500 clinics throughout the world in 2001 and had approximately 5000 physicians with which to support in excess of 8.2 million beneficiaries (Anders, 2001). GPRMC provides care with over 900 physicians, to include physicians in training as well (Larry Anderson, personal communication, December 11, 2002).

Certainly the beneficiaries medical needs of the MHS and GPRMC outstrip the capability to treat everyone within the organization. As a result, TRICARE Management Activity (TMA) has contracted with seven Managed Care Support Contractors

(MCSC) throughout the U.S. to augment the MHS's patient care capacity. They are currently organized into 12 geographic management regions. The managed care network is established by the MCSC to provide healthcare services that the MTF is unable to provide internally by contracting with physicians to provide this care. The MCSC is also responsible for enrolling beneficiaries into TRICARE and for processing all TRICARE claims. The TRICARE regions were established in an attempt to keep beneficiary populations relatively equal throughout. Appendix C shows the geographical breakdown for each region.

The TRICARE benefit structure consists of a triple option. TRICARE offers Prime, Extra and Standard. Each of these benefit options allow for varying degrees of freedom to the beneficiary. TRICARE Prime beneficiaries are enrolled to either the MTF or the MCSC. The MTF and MCSC assign a Primary Care Manager (PCM) that the beneficiary must seek out when needing care. The PCM manages the routine care of beneficiaries and authorizes more complex and expensive care from specialists. The beneficiary relinquishes the choice of where to obtain care in exchange for dramatically reduced healthcare costs. TRICARE Prime is the best healthcare value for most beneficiaries. TRICARE Extra and Standard are much more expensive but allow the beneficiary the freedom to choose where to seek healthcare. TMA encourages beneficiaries to seek out TRICARE Prime because it is the most cost efficient and best model to provide health and preventive health care services.

Under the contractual agreement between TMA and each of the services, the MTF is required to provide all care (for which they are capable) to those enrolled at their respective facilities. Active Duty are automatically enrolled to the MTF as are most who have opted for TRICARE Prime. There are smaller variations on the theme, but they are beyond the focus of this study. The number of enrolled beneficiaries to the MTF is adjusted annually based on projected capacity at each of GPRMC's MTFs. This allows the contractor to estimate how robust a network to establish, as well as to determine its expected workload.

Financial incentives do not currently exist under the current versions of contracts to encourage MTF commanders to properly manage the MTF-enrolled population and limit the amount of care sought by an MTF-enrollee on the network. However, under TNEX business rules the MTF commander will be incentivized to control the behavior of MTF-enrolled beneficiaries. If an MTF-enrolled beneficiary seeks care from the MCSC, TMA is required to reimburse the MCSC utilizing a complex financial formula called the Bid Price Adjustment (BPA). Two major components of the BPA are expected workload for the MTF and total purchased care costs (Integrated Health Care Services, 1998). Contractors are pre-funded during option years based on MTF enrollment and workload projections. The BPA process adjusts for over or under performance by the MTF. Under the rules of the BPA, final adjustments for network encounters do not occur until six months after the closing of an option year. Furthermore, the true costs of encounters become obscured due to numerous adjustments and highly complex financial calculations, estimates, and formulas used elsewhere in the BPA process. Calculations are made at the aggregate level and hinder specific knowledge of individual encounters and their impact. This distinction is important. The current process is highly complex. It is anticipated that claims under TNEX will be processed every 90 days, a significant shift in procedures and commander accountability. Contractors no longer require pre-funding, but will be paid claim-by-claim (TMA, 2002).

Currently within the region, there is no methodology to estimate the financial impact of backfill/augmentation missions as a result of the anticipated lost productivity. Current analysis is primarily qualitative and there is significant resistance to GPRMC's decision-making process from the MTFs when they are directed to relinquish a provider. There has been an observed need to quantify and regulate the decision making process for this question in the recent past (COL Glenn Taplin, personal communication, November 1, 2002). In fact, the MHS has been studying and attempting to quantify the cost of readiness for several years with varying degrees of success.

Readiness makes military medicine and managing it unique and troublesome. Demands incomparable to civilian counterparts consternate management and the delivery of care. Table 1 lists common readiness events that complicate healthcare delivery in the MHS.

Table 1. Readiness Training Requirements

Training Session	**Who Attends**	**Frequency**	**Duration**
Common Tasks Testing	All Soldiers	Annually	8 Hours
Hague-Geneva	All Soldiers	Annually	1 Hour
Code of Conduct	All Soldiers	Annually	1 Hour
Anti-terrorism	All Soldiers	Annually	1 Hour
PT Testing	All Soldiers	Semi-annually	8 Hours
Operational Security Training and Briefing	All Soldiers	Annually	1 Hour
Subversion and Espionage Directed Against US Army	All Soldiers	Every 2 years	1 Hour
Refresher Security Training	All Soldiers	Annually	1 Hour
CBT Terrorist Training	All Soldiers	Annually	1 Hour
Officer Professional Development	Officers	Quarterly	4 Days
NBC	Officers	Once	15 Days
Leadership	Officers	Once	7 Days
CAS3	Officers	Once	63 Days
Officer Advance Course	Officers	Once	63 Days

Equally important to understanding the uniqueness of military health care is the impending financial shift in the MCSC, and the real cost shift to MTFs for relinquishing a provider as a result of backfill/augmentation. TNEX is an important change in the MCSC financial structure, and many factors led to the eventual need for TNEX (Aiyelawo, 2002).

The current generation of TRICARE contracts are nearing the end of their useful lives. Many of the contracts in use throughout the country are near the end of non-renewable extensions as the cost of care continues to grow. The current planning factor used by TMA is 10% annual non-pharmacy growth (Aiyelawo, 2002). Additionally, congressionally mandated changes to TRICARE benefits have drastically changed the environment in which the contracts are administered. The fiscal year 2002 cost to TMA for TRICARE for Life (TFL) was $2.8 billion dollars, an administrative and financial cost that was not envisioned when the current TRICARE contracts were written. (Aiyelawo, 2002). TFL is a newly established benefit that fulfills the promise of lifetime healthcare coverage to MEDICARE eligible beneficiaries. Congressional mandates required TMA to temporarily obligate funds to pay for TFL and seek subsequent reimbursement. While the ultimate result was negligible, it did require TMA to temporarily shift assets unexpectedly (TMA, 2002). As a result of increasing healthcare costs and externally imposed changes to benefits, TMA is limited in its ability to predict budgetary expenditures, adding to the need for changes under TNEX (Aiyelawo, 2002).

Under the recently proposed changes to the MCSC structure, the impact and magnitude of backfill/augmentation taskings will be clearly evident. The new financial structure of TNEX removes the burdensome BPA process discussed earlier. Under the old TRICARE contracts, the cost of an MTF-enrolled patient's visit on the MCSC occurring in the civilian network was passed on to TMA. In the aggregate, if a service's TRICARE costs exceeded those predicted, TMA would require the service to provide additional funding. This process removed the impact of that visit away from those most capable of managing these encounters, the MTF commander. (Integrated Health Care Services, 1998).

The MTF will be pre-funded (plus 10% for non-pharmacy inflation) based on previous fiscal year productivity under revised financing to be used in TNEX. Funding for active duty soldiers falls under the Supplemental Care Program also administered by TMA (TMA, 2002). Commanders do not currently control supplemental care dollars. Claims for active duty are paid directly by TMA. Commanders are expected to regain control of supplemental care dollars under TNEX. This act will align the purse strings with those best prepared to maximize healthcare dollars. The contractors will bill directly to the MTF for any care purchased on the network by an MTF-enrolled beneficiary. Any changes to capacity, productivity, or service lines of an MTF will directly and immediately impact the MTF. The Commander will control his or her budget for enrolled beneficiaries and seek the most cost effective means of supplying healthcare. As a result of this newfound freedom and responsibility, the real impact and cost of backfill/augmentation taskings directed by GPRMC and MEDCOM will be felt within the MTF's budget for the first time.

The magnitude of taskings within GPRMC is significant. Table 2 displays the sheer volume of taskings for the last three fiscal years.

Table 2. Lost Mandays Due to PROFIS and backfill/augmentation Taskings

Fiscal year 2000	Fiscal year 2001	Fiscal year 2002
29,990	25,917	37,717

GPRMC experienced over a 45% increase in lost mandays from fiscal year 2001 to fiscal year 2002. A manday is a measure of availability to work. Clearly the War-on-Terror and the resulting demands on MEDCOM are significant factors related to the large increase from fiscal year 2001. The rapidity of PROFIS physician demands, backfill, and augmentation taskings lends validity to the need for an improved methodology to study and calculate the financial impact of backfill taskings within the region.

Statement of the Problem or Question

Given the future financial structure of TMA's Managed Care Support Contracts and the use of revised financing, develop a decision support system that evaluates the temporary reassignment of physicians in the GPRMC to minimize the financial impact of providing backfill and augmentation physicians. The purpose of this study is to analyze the data and develop a methodology to estimate costs associated with backfill missions within GPRMC, which then can be adequately resourced. Current qualitative analysis is subject to much conjecture. The impending changes to how healthcare is financed at the MTF level in the MHS, and the real financial risk looming make this study critical to ensuring the fiscal health of each MTF in the region and the region as a whole. This decision support system is expected to standardize the backfill and augmentation decision-making process for GPRMC by June 2003.

Literature Review

The essential elements necessary for GPRMC's decision support system include productivity modeling, capacity modeling, and the phenomenon of "surge" or "excess capacity". In addition, strategic management issues are at play, as well as issues with data quality and cost accounting. These important elements and considerations reinforce the need to develop a nimble, reliable decision support system to assist in the backfill process. All of these issues are complex and interrelated and should be viewed in light of readiness issues and the continued turmoil of temporary physician shortages.

Imagine for a moment this entire process as a schematic diagram for an electrical circuit. Given this metaphor, the "switch" that initiates all the action is the PROFIS system utilized by the Army. Additionally, GPRMC honors backfill and augmentation requests from MTFs for other than PROFIS taskings. Reasons vary, but are all tied to provider losses.

The MHS is unique to other seemingly comparable healthcare systems. Civilian healthcare systems do not struggle with continuing to care for an ever-increasing beneficiary base, while deploying most of the support staff and providers from the organization. This is the reality that MTF commanders deal with daily, a frustrating experience on a good day.

The future is unclear as this paper is written, but a continued high operational tempo is realistic. Continuing high demand for PROFIS personnel is reasonable and must be considered. Capturing and quantifying the true "cost" of readiness has been a major undertaking in the AMEDD for years. Numerous studies and papers have analyzed and contemplated the confluence of medical and readiness factors.

While several previous research studies addressed the cost of readiness, all address the question from different angles. Additionally, all previous studies were written under current TRICARE contracts and struggled with the BPA and the confounding effect it has on studying this question. However, several important factors are identified and deserve contemplation while developing the regions decision support system; heretofore referred as the Backfill Analysis Tool (BAT).

Colonel Gregg Anders studied temporary physician staffing in his unpublished manuscript *Temporary Physician Staffing in a Government Health System: Operational Issues and Solutions,* produced in 2001. In his paper, shrinking resources and increasing clinical demands prompted the need for study. Staffing levels served as the focus of the paper in which he, attempted to develop a methodology to adjust staffing levels after considering use of existing capacity. Colonel Anders sought to modify the Army's current authorization system called the Automated Staffing Assessment Model (ASAM). ASAM is a mathematical model used to determine minimum essential medical manpower requirements. It is site specific and quantifies readiness requirements as it attempts to keep pace with current healthcare trends. COL Anders developed the Minimal Medical Essential Capacity (MMEC) as a result of his research. The MMEC augmented ASAM II calculations. ASAM II was in use in 2001 during the writing of Anders' paper. The ASAM II model is currently being replaced by a population-based ASAM III model (Program Analysis and Evaluation Directorate, 2002). In Anders' paper he identifies several weaknesses of the ASAM II Model. Specifically, the model is based on historical workload, often 18 months old or more. Authorizations are not based on the current reality of the facility/clinic.

Adjustments to the ASAM II by using the MMEC were made to account for excessive use of space-available appointments, productivity, and enrollment of TRICARE Prime beneficiaries. Anders indicated that allowing use of space-available appointments for patients not enrolled to the MTF wasted capacity, and thus decremented the facility. The Template Analysis Tool (TAT) available on the TRICARE website was used to observe appointment trends. The TAT was developed in Europe in 1998. It was intended to help MTFs meet established TRICARE Prime access standards (Hill, 2001). Anders inferred productivity by assuming that appointments unfilled, blocked, or used for non-enrolled patients indicated poorer productivity and use of available resources and capacity. Through this process, he established whether clinics were operating optimally. Those not fulfilling templated appointments were deemed less productive. Finally, adjustments to ASAM II were made based on whether the MTF met its enrollment goals established during contract negotiations.

While the MMEC is an early step towards improved decision-making, it has several limitations. First and foremost, the MMEC is only an equation and no tool was ever developed. The MMEC never left the realm of theoretical application. Additionally, it is only useful for primary care specialties. It is also only able to address staffing levels for one MTF. It is not able to analyze the problem from a regional perspective. The bedrock of the MMEC is the ASAM II model. Use of extremely dated historical workload is always retrospective and doesn't deal in current conditions. ASAM II models used data no less than two fiscal years old. The MMEC also fails to consider a scenario in which an MTF is already operating with staffing below what the ASAM II model already indicates is necessary. Finally, the MMEC does not allow the GPRMC commander to look at and assess the financial impact of a backfill/augmentation decision. The analysis is too aggregated and doesn't analyze the question for revised financing.

On March 30, 2001 MEDCOM published a commissioned study conducted by SRA International, Inc. titled *Implications of TRICARE on the RC Structure*. The authors of this study determined the available options and best strategies to replace personnel lost due to deployments. Like other works, the authors correctly identified the problem of lost providers as a paramount issue to the AMEDD. Several salient issues addressed have significant bearing on this research.

Alternatives to provider losses are analyzed in detail. The scope and range of options available are as complex as the problem of provider volatility itself. Options include cross leveling providers within the region (backfill/augmentation), reserve component backfill, use of a United States Army Reserve (USAR) Hospital, Individual Ready Reserve and Individual Mobilization Augmentee, volunteer Reserve Component backfill, resource sharing/support agreements, direct contracting, use of MEDCOM's umbrella contract and combinations of all the above. Examination of each alternative would cause exponential growth of the scope identified for this research. However, several options and factors are relevant and deserve closer inspection.

The identification of surge capacity as a phenomenon by the SRA International, Inc. paper is significant and central to this paper. Surge occurs when a clinic or service is forced to improve productivity beyond its historical level. We will use the temporary loss of a physician for our purposes, but other internal circumstances could create the same effect. Many command directed decisions come into play during a period of surge, all temporarily increasing a clinic or service's throughput. Commanders can choose to cancel leaves, extend clinic hours, suspend non-essential training, and any number of inventive actions all aimed at forcing more work out of fewer physicians. However, this technique is limited by how quickly the staff succumbs to the increased workload. Potential rate limiting factors such as equipment or support staff may also limit the extent and duration of a surge. Surge is perhaps the single most important confounding factor when modeling productivity during backfill/augmentation episodes. For example, the assumption that the lost workload of Dr. Workinharder will be entirely absorbed by the MCSC is incorrect. Research for this project indicates that this simply is not true. Often it is a portion, or perhaps none.

The authors of the SRA International, Inc. paper conclude that within GPRMC as a whole, there appears to be a negative correlation between mandays of physician time lost to deployments and workload produced. This contradicts the paper's original hypothesis. In many cases workload increased when deployment mandays of physician time increased and workload decreased when deployment mandays decreased. However, this finding is not true for all MTFs. Issues to be discussed subsequently such as data quality and data systems available for use may have made detailed analysis troublesome.

GPRMC and the entire Army Medical Department utilize the AMEDD Resource Tasking System (ARTS) to generate and manage medical taskings throughout the Army as it is the source for all tasking information. ARTS is a relational database built on Microsoft Access.

The assumption that MTFs were unable to obtain backfill for deploying personnel is central to the SRA International, Inc. results. While backfill taskings do not comprise a large amount of total taskings, 17% according to the authors, further analysis of the tasking database would eliminate MTFs that did obtain backfill physicians. Matching PROFIS taskings to backfill requests by date and medical specialty would screen out MTFs that obtained relief for a PROFIS loss. Additionally, the study did not analyze lost mandays and productivity at MTFs forced to provide a backfill/augmentee to another requesting MTF. The study focused on macro-level command issues and was not intended to observe the second and third order effects currently under discussion.

The SRA International, Inc. study and others discovered while conducting research for this project struggled with data that are contradictory to basic assumptions. The study observed, “Within GPRMC as a whole, there appears to be a negative correlation between man days of physician time lost to deployments and workload produced. Surprisingly this correlation is the opposite of the hypothesis” (SRA, 2001). Productivity measured during times of provider loss often increased. Productivity often decreases when lost providers return from backfill taskings and data problems consternate the picture even more. It appears that increasing productivity during provider losses could be explained by surging.

Another study conducted in 2001 by Kim, Rheney, and St. Andrews titled *Estimating the Cost of Readiness* found that physicians often take leave following backfill taskings. This would appear to be one of many possible explanations for lost production following the return of providers. Also, a review of available studies did not indicate that MTFs obtaining backfill support were excluded from the data samples taken. Without this level of detail, researchers would be looking for lost productivity in MTFs staffed at historical levels. In fact, the Kim et al. study indicates backfills occurred. The utility of the BAT perhaps lies in its effort to control for as many of these confounding factors as possible, in an effort to approach a reasonably good estimate of backfill costs in the region.

The unpublished manuscript by Kim et al. dovetails nicely off the SRA International, Inc. study. It evaluates the cost of readiness at Darnall Army Community Hospital (DACH) during a deployment of several physicians assigned to the 555th Forward Surgical Team. The 555th is a highly deployable standalone surgical unit capable of being deployed far forward in the battlefield. Members of the 555th came from both Ft. Hood and

Ft. Sill. The 555^{th} deployed for 6 months in support of operations in Afghanistan in fiscal year 2002. The Kim et al. study evaluates the nuances of surge capacity and numerous phenomenons confounding analysis of backfill costs. The study also "systemizes" the process MTFs use when reacting to provider losses. Appendix D illustrates the strategies identified in the study and the direct impact they have on workload, acuity, and costs.

Internal solutions are the quickest and most cost effective measures available to the commander. Increasing productivity as a result of command decisions is a readily available option. Superficially, internal solutions can be seen as cost free. However, a more holistic view shows there is a price to pay in provider satisfaction and morale. These costs are eventually felt long-term in provider and staff retention. Robbing Peter to pay Paul is of limited value when viewed from a systems perspective.

DACH utilized internal solutions exclusively during the course of the Kim et al. study. The leadership chose to retain the highest acuity patients in its Orthopedics Service and allow the excess workload to leak to the network. This allowed the more complex, expensive, and professionally challenging cases to stay in-house. Table 3 from the Kim et al. study shows the corresponding change in Relative Value Units (RVU) during the study period, November 2001 through May 2002. RVUs are number values given to different services due to the varying workload and acuity of the outpatient encounter (Kongstvedt, 2001).

Table 3. Changes in case complexity

	Avg providers available (before)	Avg RVUs before deployment	Avg providers available (during)	Avg RVUs during deployment
Ft. Hood Ortho Clinic	4.33	5.74	4.26	5.93
Ft. Hood General Surg Clinic	4.22	***10.19***	3.02	***14.86***
Ft. Sill General Surg Clinic	2.04	***12.12***	1.80	***16.70***

Additional steps taken by DACH include increasing appointment wait times and accepting increased demand for Emergency Room (ER) services.

The study observed mixed indications of lost productivity. Ft. Sill General Surgery Clinic and Ft. Hood actually increased productivity measured in RVUs. The example from the Kim et al. study is a good illustration of the complexity of measuring productivity and accounting for excess capacity. An uninformed evaluation of the situation at both facilities could lead one to believe that real productivity went up substantially. However, the study revealed that more complex cases were retained, causing the unexplained spike in RVUs during the deployment.

This is especially evident when the real drop in visits in Table 4 is looked at in conjunction with the RVU spike.

Table 4. Ft. Hood Orthopedic Visit Comparison

	Avg Monthly Visits (Before Deployment)	Avg Monthly Visits (During Deployment)
Ft. Hood Gen Surg	734.08	735.40
Ft. Hood Orthopedics	***605.85***	***525.40***
Ft. Sill Gen Surg	309.00	293.00

The DACH study struggled with the limitations of gathering very recent purchased claims data. Purchased claims data is not reliable for up to 180 days following the patient encounter. Purchased care claims reside on TMA's data mart, the MHS Mart (M2). The M2 is a data warehouse managed by TMA that is available to MHS activities. Important direct care and purchased care data are available through the M2. TMA applies a completion factor during the 180 days, but the figures do not reflect actual claims. The lack of complete claims data hindered the authors' desire to quantify orthopedic claims. Further discussion of claims data is found in the methods and procedures section of this paper.

Surging and the overt retention of complex cases in Ft. Hood Orthopedics certainly help explain some of the change, but there are other possibilities. For example, support staff ratios may have improved to enable more procedures. Also, a rate-limiting factor such as recovery beds may have improved to allow greater throughput.

The Kim et al. study observed that commanders then move into external military solutions as internal solutions are exhausted. Backfills and augmentations, also the topic of this study, may be requested from within the region. Additionally, backfill requests may even be sent Army wide if circumstances warrant. However, the Operations NCO for GPRMC, SFC Konstantynowicz, related that requests remain within the regions almost without exception (SFC Konstantynowicz, personal communication, October 17, 2002).

The final and most expensive option available to MTF commander is to contract for the lost provider. This contract could be with the MCSC, who has the right of first refusal, or with an entirely new contractor. Internal resource sharing agreements, mutually beneficial to both the MCSC and the MTF, could also deflect much of the cost of lost productivity. The MTF typically provides support staff and space for internal resource sharing providers. The MCSC usually provides the physician. Both the MHS and the MCSC experience a cost avoidance. However, Deputy Commanders for Administration (DCAs) in the DACH study indicated that contracting is expensive and slow. Finding suitable providers and negotiating a modification to existing contracts often exceed the amount of time a replacement provider is needed. MTFs are unable to even attempt the contracting solution in many instances. Locations such as

Ft. Polk, in rural Louisiana struggle to attract physicians, regardless of how competitive the pay is. The MCSC must deal with the same limitations as well. Contracting options only work in certain areas. Commanders in less than desirable locations are left with internal and external (backfill and augmentation) military options as their primary tools.

The consulting firm of Booz-Allen & Hamilton conducted a staff study at Ft. Campbell in 1998. The purpose of the study was two fold: The consultants sought to establish current commercial best practices in the healthcare arena for staffing models. Secondly, the team sought to develop a maximum efficiency model for the MTF. In so doing, the authors developed a methodology to identify and account for military unique events that limit provider availability. Similar research continues to highlight provider loss and the impact it has on healthcare. Provider availability directly affects capacity modeling and productivity measures. Military unique distracters must be fully considered to allow the BAT to account for excess productivity and capacity in assessing backfill decision.

This project introduces the concept of full time equivalent employees (FTE). This is an important element of this project and requires elucidation. According to MEDCOM’s Primary Care Optimization office, a full time employee is one who is available to care for patients for the full clinical day of 7.5 hours. This fictional person is equivalent to a 1.0 FTE. This type of employee would have almost no demands placed on him or her outside of clinical needs. An FTE is the adjusted fraction of a full time employee that the provider is available for care after non-available time is subtracted. (MEDCOM Health Policy Services/Clinical Services Division, 2003). For example, a physician that is also a department chief may only be a .5 FTE in the clinic setting; his or her workload would then be judged against only being available half as often as a full-time physician.

This project is consistent with the Ft. Campbell study in regard to much of the background analysis on active duty physician productivity. Researchers identified over 4,900 hours of general soldier mandatory training events throughout the year that had to be attended by the 88 providers under study. This equated to the loss of 2.43 Full Time Equivalents (FTEs). Additionally, PROFIS specific taskings for the 88 providers yielded 3,200 lost hours for fiscal year 1997. This equated to 1.59 lost FTEs due to PROFIS related absences. In accordance with Army Regulation 350-4, providers identified as PROFIS physicians are required to attend 95 hours of annual PROFIS specific training. As a result, the 22 physicians falling in the PROFIS category were lost for a total of 6169.3 hours. This equates to 3.06 FTEs. The importance of these figures cannot be understated. These are real hours taken away from patient care. Perceived satisfaction, quality of care, retention, productivity, access to care, MCSC costs, and numerous other factors could potentially be affected.

The Ft. Campbell study determined that approximately 10% of a military physician's time was lost to readiness and military unique factors. Likewise, during a recent briefing on capacity planning by TMA in Alexandria, VA, a factor of 10% was presented as the figure being used by the Costing Model Work Group (TMA, 2002). The ASAM III model currently under deployment throughout the AMEDD uses a benchmark of .79 FTE for active duty Primary Care Providers (Colonel Glen Mitchell, personal communication, November 29, 2002). However, there is no consensus on available FTE goals and they vary from facility to facility. LTC George Patrin, MEDCOM's Primary Care Optimization Project Officer indicates a .6 available FTE is more appropriate when military unique distracters are taken into consideration (George Patrin, Personal Communication, December 2, 2002). The BAT utilizes a value of .7 available FTE that meets the opposing values in the middle.

Productivity plays a key role in the backfill question. At its very core, the concept of productivity is shockingly simple. It is the relationship between physical inputs and outputs.

(Chew, 1998). Yet, practical implementation of productivity measures can be problematic and much debate surrounds proper measures. Productivity has been traditionally measured by the number of, and types of patients a certain provider is able to see in a given period of time. This can be in the form of office visits, procedures, admissions and other encounters. Productivity can be measured in financial terms as well. For example, a system such as the MHS would be interested in keeping the cost per visit/procedure as low as possible. However, not all visits and procedures are created equal and a more comprehensive view of workload is needed to approach a realistic picture of productivity.

The MHS, along with much of the civilian healthcare sector has adopted the use of Relative Value Units (RVUs) as a measure of physician productivity. The RVU is an effort to quantify the variation between patient types and visits. Moore (2002) relates, "The work RVUs are intended to reflect the time required to perform the service; the technical skill, mental and physical effort and judgment involved; and psychological stress associated with the physician's concern" (Moore, 2002). For instance, a visit with a RVU value of 3 would be three times as intensive as a visit with an RVU of 1.

Inpatient encounters vary in intensity as well. The MHS utilizes the Relative Weighted Product (RWP) as a workload measure based on the Diagnosis Related Group (DRG) assigned to an inpatient record. It represents the resource consumption of an inpatient stay relative to that of the average patient (Coventry et al., 1995). RVUs and RWPs allow the MHS to compensate for the acuity of patients when evaluating and comparing healthcare encounters.

Factors outside the physician-patient encounter also dramatically affect productivity. For instance, individual physician characteristics and the way in which a provider practices medicine can impact productivity. Studies have found wide variations in the way physicians practice medicine. Older physicians tend to spend less time actually seeing patients during a work week, and more time per encounter than younger physicians do when actually seeing patients (Ricciardi, 1996). The demands of military service also affect productivity, especially if the non-care time is not properly accounted for (available FTE time). Variations between treatment facilities in clinic space, patient flow, communications equipment, and staffing all impact productivity. Nonetheless, making comparisons between MTFs (benchmarking) is informative and useful as long as those dealing with the results understand the limitations of benchmarking and its intended use.

Benchmarking has existed as a business tool for years. Yet, confusion surrounding its purpose continues. Benchmarking is about the process. To gain maximum benefit, benchmarking should be used not only to identify areas needing improvement, but also to foster movement to the next step-taking action (Witt, 2001). While the metrics are certainly central to the process, benchmarking is primarily a process to evaluate performance of some nature (Dunn, 2002). The limitations of benchmarking are tied to the inherent difficulty of measuring healthcare productivity. Numerous variables beyond the scope of how the MHS collects clinical data confound benchmarking efforts. Staffing may vary during a study period. Restricted clinic space may also cause comparisons to be strained. These and many others make productivity and benchmarking a challenge in healthcare. This variance attributable to factors other than the metric being measured creates unintended differences and error. However, regardless of its shortcomings, benchmarking is useful and necessary in making daily business decisions and is integral to the BAT. A key assumption for the BAT is that benchmarking will provide a useful service and facilitate a more sophisticated backfill evaluation process than is currently occurring.

Capacity modeling is fundamental to the BAT as well. Capacity is traditionally thought of as a calculated figure (population, number of hours of surgery, etc.) that a provider, clinic, or service line can support. Like most models, capacity modeling is inherently variable due to the realities of life and the wide range of circumstances surrounding the provision of care in the MHS. Figures for the most clearly understood setting of care, primary care, vary widely. Empanelled populations in the MHS range from 1,000 to 3,000 (TMA, 2002). Often the variation is a result of how the data was collected, what question was asked, and who was counting (TMA, 2002). Recently TMA instituted an interesting model to create a reasonably realistic picture of demand and productivity, key elements of capacity. Adjustments are made for demographics utilizing equivalent lives (TMA, 2002). Adjustments for equivalent lives are made for age and gender. Although, additional case mix adjustments would be useful, it is beyond the capabilities of the MHS at this time (TMA, 2002).

With patient variation having been controlled for by equivalent life factors, the capacity model controls for variations in provider availability as well. Provider availability is modified using adjusted FTEs (TMA, 2002). Adjusted FTEs are entered and tracked in the DoD's Medical Expense and Reporting System (MEPRS). As mentioned previously, MTF commanders will be fiscally responsible for those enrolled to the MTF. Accordingly, analysis under the new model accounts for non-enrolled patients and excludes them. The result is a more complete picture of capacity at each of the GPRMC's MTFs in a given clinical specialty.

The BAT must also integrate individual personnel issues into the model as well. High operational tempo and frequent missions away from home have degraded the lives of our soldiers. Members of all services have experienced increased deployments and work demands as total end strength numbers have declined and operational needs have increased. DoD has implemented a plan to closely manage the Personnel TEMPO (PERSTEMPO) of every service member. The fiscal year 2000 and fiscal year 2001 National Defense Authorization Acts (NDAA) both authorized high-deployment per diem rates for solders experiencing unreasonably high deployments (PERSCOM, 2002). Events that add up towards a physician's PERSTEMPO count occur "when official duties at a location or under circumstances that make it unfeasible for a soldier to spend off-duty time in the housing in which the member resides when on garrison duty…" (PERSCOM, 2002). Physicians tasked for backfill or augmentation missions will be on TDY status and will meet the requirements for a countable PERSTEMPO event. Each service member has a PERSTEMPO account tracked by PERSCOM. Service members with PERSTEMPO days meeting or exceeding 182 days must obtain the approval of the first general officer in his or her chain of command to be deployed (Business Rules for the Leader, 2000). Personnel that break the PERSTEMPO management figure become eligible for $100 a day per diem for every day exceeding the management number. Currently the Secretary of Defense has suspended the payment of the PERTEMPO per diem (Secretary of Defense, 2002). However, PERSTEMPO days will continue to be tracked. Management of personnel at risk for backfill missions must continue to avoid potential excessive costs as a result of a backfill tasking when payments resume.

Purpose (Variables/Working Hypothesis)

The purpose of this study is to analyze the relevant data, build upon previous research, and develop an operationalized methodology to estimate the financial costs to the MTF as a result of temporary physician losses caused by backfills and augmentations mandated by higher headquarters. All historical data used to measure capacity, productivity, and taskings will be taken from fiscal year 2001 for the specialties of: Pediatrics, Internal Medicine, Family Medicine, General Surgery, and Orthopedic Surgery.

Variables: GPRMC maintains a pool of contract physicians working within the region. A binary data point will be whether the AOC needed as backfill matches the provider specialty available for use under travel clauses, one if yes, zero if otherwise. The region also employs civilian contracted general surgeons with travel clauses in addition to the military providers. (Isabelle Matthews, personal communication, October

15, 2002). Total PERSTEMPO rolling deployment days unique to each individual must be assessed; an individual with a value in excess of 182 days, when accounting for potential deployment, will be screened out from consideration due to the potentially extreme cost of paying the PERSTEMPO per diem rate of $100 per day. The PERSTEMPO variable is continuous. However, a logic evaluation of the variable will be binary; One if equal to or greater than 182 days (to include possible backfill or augmentation days), zero if otherwise.

Numerous continuous variables will be used to conduct financial evaluations. Cost analysis for the BAT begins with productivity estimation, expected leakage, and concludes with purchased care cost estimation. An important factor in evaluating each MTF with the BAT is the direct care patient beneficiary category mix, expressed as a percentage of all direct care delivered. For the purposes of this study, patients will be identified as either TRICARE Prime or Non-Prime. Establishing the relationship between Prime and Non-Prime will allow assumptions about the potential impact of patients normally seen in the MTF seeking care on the network. An assumption is that the patient mix for leakage to the network will reasonably mimic the direct care setting.

Average productivity for the BAT will be defined as total annual outputs (RVUs or RWPs) divided by the total number of available FTEs for the data collection period. The methods and procedures section of this paper goes into great detail concerning how productivity is established. Average RVUs per month for the following specialties will be used: Pediatrics, Internal Medicine, and Family Practice. General Surgeons and Orthopedic Surgeons will be evaluated using average RWPs per month for procedures and RVUs for clinic visits.

Benchmarking will be used to make financial comparisons throughout the region. The previous methodology for establishing productivity will be applied to every MTF within the GPRMC. As mentioned before, there is a wide disparity between MTFs throughout GPRMC. A few MTFs are full service tertiary care facilities, while others are outpatient clinics with limited ambulatory surgery capacity. As a result, assumptions and restraints must be placed on productivity models when attempting to study surge capacity. The region was broken down into like kind groupings as a result of discussions with expert advisors.

Consultations with Mr. Ron James, Data Analysis Section Chief of the Patient Administration System and Biostatic Activity (PASBA), indicated that utilizing a GPRMC group average to establish an average maximum capacity would be best to use as a benchmark when evaluating surge (Ron James, personal communication, December 1, 2002). Maximum capacity is the theoretical maximum level of surge capable at an MTF. Demand estimated beyond the GPRMC group average is assumed to be beyond the capability of the MTF. This assumption places parameters on quantifying capacity for each MTF and specialty under study. The group average accounts for a facility that is performing at peak performance and blends it with others not performing as well. The assumption is that all MTFs have the capacity to meet the group average.

Group 1 will consist of Brooke Army Medical Center, William Beaumont Army Medical Center, and Darnall Army Community Hospital. These facilities are the largest and most complex of the 10 MTFs in the region. All have Graduate Medical Education (GME) programs and are resourced at a much higher level to accommodate the higher operational tempo and non-clinical demands placed on physicians. Numerous providers at these facilities are often tasked with jobs beyond patient care and would not stand up well to comparisons with others in less complex surroundings (Ron James, personal communication, November 12, 2002). Group 2 consists of five MTFs that do not conduct GME training, but operate both inpatient and outpatient care in a community setting. Certainly variation exists even within this group. Yet, for this comparison these MTFs are most alike. The MTFs constituting Group 2 are: Evans Army Community Hospital, Bayne Jones Army Community Hospital, Irwin Army

Community Hospital, Reynolds Army Community Hospital, and General Leonard Wood Army Community Hospital. Group 3 is the last grouping of MTFs. It consists of Raymond Bliss Army Health Center and Munson Army Health Center. Both are strictly outpatient facilities and offer only limited ambulatory surgery.

The utility of estimating productivity is the ability to compare actual MTF productivity to the GPRMC average for the relevant group and approximate expected surge and or leakage. Table 5 illustrates how the GPRMC average will be used to benchmark productivity and estimate surge capacity. Again, workload demands beyond estimated surge capabilities are assumed to leak to the MCSC. This is a simple demonstration of the underlying logic. The example uses visits as the type of encounter but would be replaced by average monthly RVUs per available FTE or average monthly RWPs per average monthly available FTE in reality. In the example, MTF X was able to produce 150 visits a month on average for the fiscal year with 3 FTEs. All things being equal, this is the inferred demand. Each FTE is able to produce 50 visits per month. However, the GPRMC average for the MTF's group is 65 visits per month, per FTE. When 65 visits per month is applied to the two remaining providers at MTF X an assumption is made. Productivity can be temporarily increased to meet the GPRMC average, creating the surge effect. However, the remaining two providers can only produce 130 visits per month while surging. The expected demand is still 150 visits. The BAT estimates that 20 visits will have to be shifted to the network.

Table 5. Surge calculation using productivity estimates

	Avg # Visits per Month	Avg FTEs per Month	Avg Prod per FTE/per month
MTF X	150	3	50
GPRMC Avg per FTE/per month			65
MTF X-1	150	2	75
Excess Capacity			-10
Total Excess Cap			-20

Expected leakage to the network is either inpatient or outpatient workload. A variable will exist for average inpatient purchased care costs unique to each MTF catchment area, grouped by each medical specialty under study. Similarly, a variable for average outpatient purchased care costs unique to each MTF catchment area, grouped by medical specialty will be calculated. These variables will be continuous.

A variable for beneficiary category mix will be calculated for each MTF. Expected purchased care claims due to leakage will be decremented. The percentage of TRICARE Prime claims will be multiplied with the expected full cost of the leakage.

TDY costs will be a summation of calculation from data tables and consist of airfare and per diem rates. The BAT assumes that backfill providers will be able to obtain government quarters to keep overall costs down. Both are continuous data. Airfare costs to each of the 10 MTFs are pre-negotiated and established each fiscal year and per diem rates are available on a data file obtained from the Defense Technical Information Center (DTIC) website. The addition of these two costs together will constitute the full estimated TDY cost for each option under consideration.

Qualitative information must be queried from the MTFs concerning the impact of a potential physician loss. This is necessary to minimize subsequent resistance to augmentation and backfill taskings; as well as to obtain buy-in from key leaders throughout the region. Circumstances looming on the operational horizon may aggravate the impact of a potential loss. For example, the MTF may be entering a Joint Commission on Accreditation of Healthcare Organizations (JCAHO) site visit or survey. Perhaps, pending physician losses during the potential loss period could render the service line incapable of providing adequate care. Each issue will be evaluated by the leadership of GPRMC for validity and comparability to extenuating circumstances evident at sister facilities. If circumstances warrant, a facility will be eliminated from the list of MTFs potentially providing backfill.

Hypothesis: The development of the BAT will identify and enable purchased care cost savings for the GPRMC. Alternate Hypothesis: The BAT will not identify and enable purchased care cost savings for the GPRMC.

Method and Procedures

Historical clinical and purchased care claims data are pulled from fiscal year 2001 data. Tasking data are real time and occur during the backfill evaluation process. The methodology for this research and the BAT is broken down into several distinct phases. Initially, screening criteria will be used to parse down the field of eligible MTFs able to provide a backfill physician at the facility that is experiencing the temporary loss. Subsequently, the process for establishing potential impact to the MCSC and the costs associated create the financial picture. Command issues are analyzed for validity. MTFs successfully arguing for removal as a potential source of a backfill provider are deleted from analysis. Finally, financial comparisons are made across the region and the leadership of GPRMC comes to a final decision.

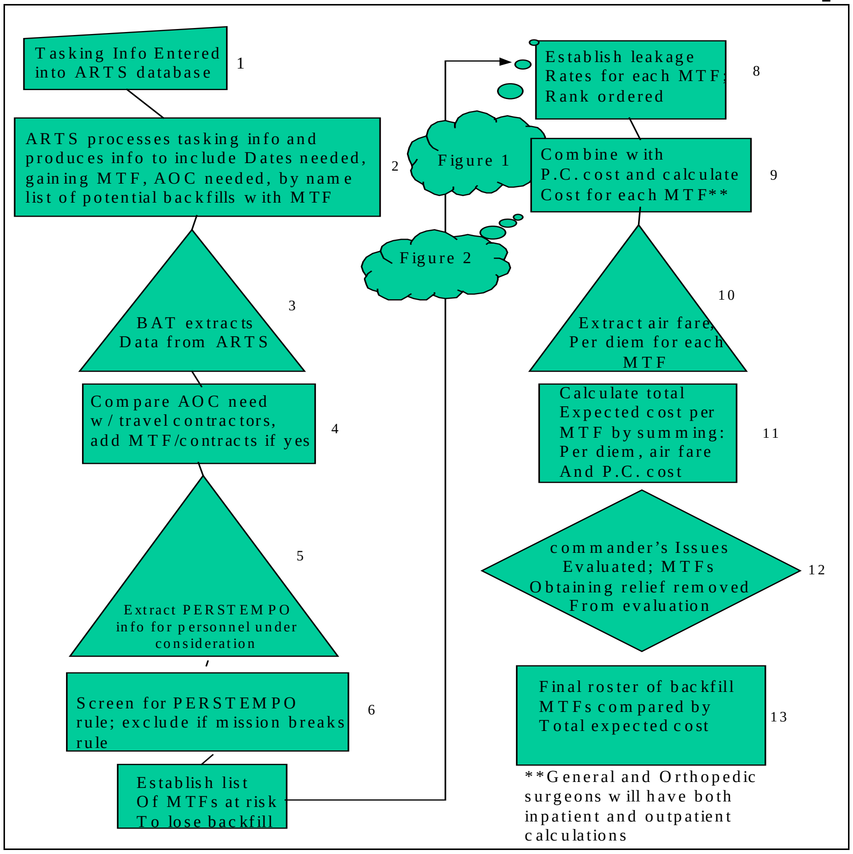

Figure 1. BAT Flow Chart

Figure 1 delineates the steps for the entire BAT evaluation process. Personnel at MEDCOM or GPRMC Operations will initiate use of the BAT as seen in step 1. The ARTS backfill tasking system produces needed data fields in step 2. The BAT extracts the AOC, requesting MTF, and dates required from ARTS in step 3. The ARTS database will provide this information in table and file format that must be manually downloaded and utilized by the BAT.

In step 4, MTFs possessing the requisite AOC will be identified. MTFs employing GPRMC contract General Surgeons will also be identified if the medical specialty matches the tasking.

GPRMC budgeting currently maintains a stand-alone spreadsheet of traveling contract physicians. Screening through step 4 occurs at the individual level as compared to the rest of the BAT process, which makes comparisons at the MTF level.

Step 5 extracts PERSTEMPO information for each individual under consideration. Currently this step is manual, but efforts are in place to establish a read only capability with PERSCOM, the Army Agency responsible for managing PERSTEMPO data.

In step 6, personnel identified as possible backfills will be screened using the PERSTEMPO rule variable. Personnel expected to meet or exceed the general officer management rule of 182 days for deployments will be excluded.

Any exclusion thus far identified in the BAT that completely exhausts the candidate list for an MTF will remove the MTF from further consideration. For example, if Ft. Hood's list of potential General Surgeons were exhausted, Ft. Hood would drop from the evaluation list. This is a logic question built into the automated BAT. Step 7 concludes the initial screening of MTFs by establishing an MTF roster against which comparisons are made. The BAT now transitions to cost analysis and evaluation.

With the goal of determining the most cost effective source of backfill personnel, the list of potential MTFs is established. The BAT establishes an expected leakage rate as seen in step 8 of the BAT flow chart. Figure 2 is a detailed explanation of how leakage is estimated. Leakage calculations are based on fiscal year 2001 data pulled from MEPRS obtained using the EAS IV database (Expense Accounting System). EAS IV is the intermediary through which GPRMC data analysts pull the requisite data. MEPRS is the DoD's cost accounting system and captures the data points needed for calculation in the BAT. MEPRS data will be loaded onto Microsoft Excel 2000 for manipulation and evaluation.

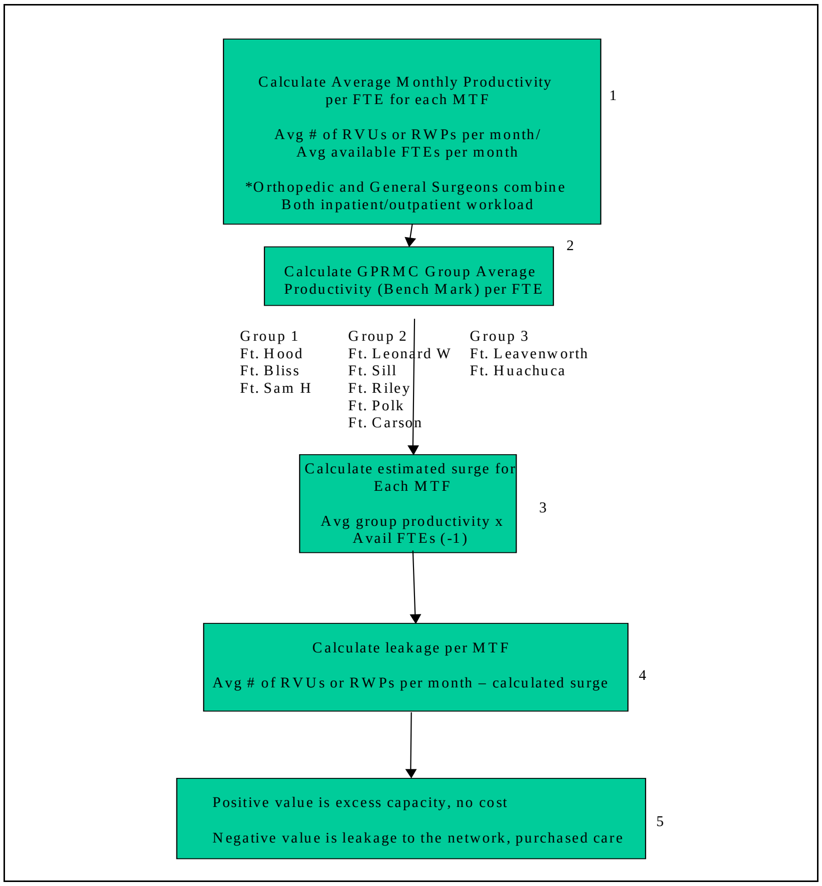

Figure 2. Leakage Estimation for Step 8

In step 1 of Figure 2, average monthly productivity as measured in RVUs and RWPs is first established for each MTF under consideration. A month is the basic unit of calculation for the BAT. Massaging the data to fit the needs of the BAT is necessary.

Data for the BAT were pulled in aggregate for the fiscal year. This was needed to keep the data files manageable. Throughout the BAT annualized data were normalized to monthly averages. Direct Care data were pulled using the M2. The data were screened to include only those encounters with the five specialties under study.

Average monthly productivity will be a manipulation of two data points; available FTEs and RVUs/RWPs. MEPRS provides the available FTEs and the M2 provides workload data (RVUs and RWPs) from direct care historical files for fiscal year 2001. Total fiscal year RVUs or RWPs for the specialties under evaluation will be divided by the total available FTEs; this figure will then be divided by 12 to establish a monthly average. General Surgeons and Orthopedic Surgeons present a special challenge in that they produce both inpatient and outpatient workload. Workload evaluations throughout the BAT process for these two specialties will include both inpatient and outpatient services.

In step 2, average monthly productivity is benchmarked against each MTF's group average. The process for establishing the group average mimics the process for calculating individual MTF average monthly productivity. The total RVUs or RWPs for each group is divided by the total available FTEs for the group; this figure is then divided by 12 to establish a monthly average group productivity.

Step 3 calculates estimated surge for each MTF. Table 5 from the literature review illustrates the basic process used. A basic assumption for the BAT is that the average group productivity per available FTE is the most productive a clinic or service can be and estimates the expected surge effect noted throughout the literature review. To determine the unique surge for each MTF, the group average productivity per available FTE is multiplied by the remaining available FTEs (assuming the loss of one provider). Step 3 utilizes a value of 1 for simplicities sake, but the BAT utilizes a value of .7 available FTE for its calculations.

Step 4 manipulates previous calculations made by the BAT. The average productivity for each MTF (average number of RVUs or RWPs per month) will be subtracted from the surge capacity calculated in step 3. In step 5, excess capacity exists if the resulting figure is negative. Surge capacity for the remaining providers exceeds the expected demand. However, if the resulting figure is positive, then leakage to the network is expected.

The steps for Figure 2 constitute step 8 of the overall BAT process. Leakage rates are then fed into step 9 of the BAT (see

Figure 1). A detailed description of the calculations constituting step 9, calculating purchased care claims, is found in Figure 3.

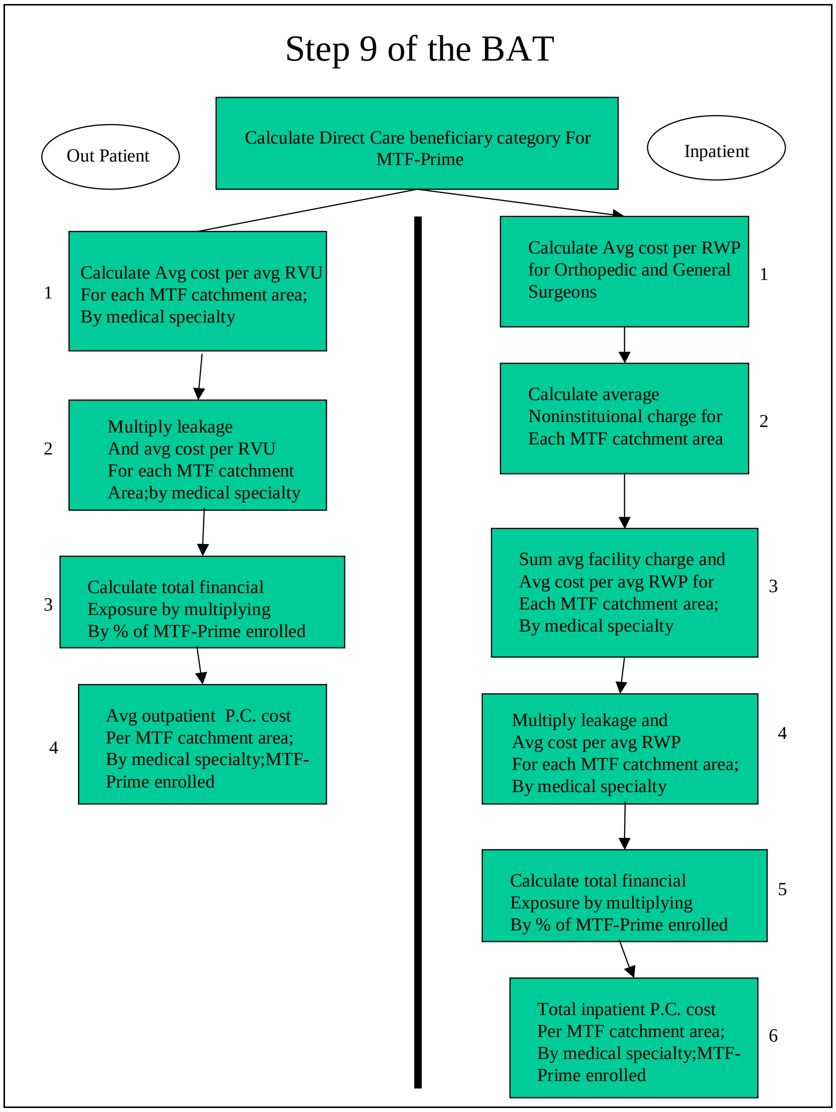

Figure 3. Leakage Estimation for Step 9 of BAT

Inpatient and outpatient purchased care claims data will be obtained from the M2 for step 9 of the BAT. Data from the M2 will be downloaded into files and tables to be manipulated by Microsoft Excel. The BAT will use Excel 2000 for data manipulation. All purchased care claims results will be evaluated using descriptive statistics to observe variation and quality. All calculations throughout Figure 3 will be specific to MTF catchment area and medical specialty. This specificity is needed to allow accurate comparisons.

Inpatient purchased care calculations for the BAT will begin by calculating the direct care beneficiary category mix. This data will be pulled from MEPRS for fiscal year 2001. The percentage of TRICARE Prime beneficiaries (enrolled to the MTF) will be applied later to purchased care claims to estimate financial risk for the MTFs in Step 4 for outpatient claims and Step 9 for inpatient claims. Prime beneficiaries enrolled to the MTF include active duty personnel that did not reflect actual enrollment on the M2 data pull.

Calculating average cost per RWP for Orthopedic or General Surgeons is step 1. This will be a manual manipulation of two data points obtained from the M2. Total purchased care claims specific for either AOC for the fiscal year are divided by the total RWPs, resulting in the average purchased care cost per RWP. Inpatients purchased care claims do not include professional fees. Professional fees will be estimated by studying noninstitutional claims from the M2. The BAT then sorts the inpatient claims by relevant Major Diagnostic Category (MDC). MDCs are found in the data files on the M2 and are broad classifications of DRGs typically grouped by the body system or etiology of disease (A Comprehensive Reference, 2002). Appendix E details each of the MDC codes used on the M2. All MDC codes except MDC 8 will be excluded. MDC 8 reasonably identifies the major functional area an Orthopedic Surgeon would operate in. GPRMC Assistant Chief of Staff for Clinical Operations, Colonel Carlos Angueira, assisted by identifying those MDCs beyond the scope of practice for Orthopedic and General Surgeons (COL Angueira, personal communication, November 10, 2002). MDCs for General Surgeon's are in Figure 4.

Major Diagnostic Categories

Code	Description
4	Diseases and Disorders of the Respiratory System
5	Diseases and Disorders of the Circulatory System
6	Diseases and Disorders of the Digestive System
7	Diseases and Disorders of the Hepatobiliary System and Pancreas
9	Diseases and Disorders of the Skin, Subcutaneous Tissue and Breast
10	Endocrine, Nutritional and Metabolic Diseases and Disorders
22	Burns
24	Multiple Significant Trauma

Figure 4. MDCs Generally Associated with General Surgeons

Sorting using MDCs will allow the BAT to estimate the inpatient purchased care claims for the period studied. Specific claims obviously beyond the scope of practice for each unique MTF will be excluded. The sorting described previously will allow the summation of total RWPs for inpatient purchased care claims of General Surgeons and Orthopedic Surgeons. The resulting calculation, total purchased care claims divided by total RWPs, will reveal the estimated cost per RWP for purchased care inpatient claims (excluding professional fees). In step 2, the average noninstitutional charge for each MTF catchment area will be calculated using M2 data. Like inpatient claims, the noninstitutional claims will be sorted by MDC to associate the claim with either a General Surgeon or an Orthopedic Surgeon. Noninstitutional charges will be a rough estimate of professional fees. According to Jack Shircel, Health Systems Analyst for GPRMC, noninstitutional claims for inpatient care include not only professional fees for the physician, but also costs for ambulance transportation, consulting fees, and other non-physician fees (Jack Shircel, Personal Communication, February 2, 2003). The result is an acknowledgement that the noninstitutional costs for the BAT will be a rough estimate and some error will be inherent in the data. Total noninstitutional charges from the M2 will be divided by total RWPs from the M2 to obtain an average noninstitutional charge per RWP. Step 3 will sum manipulations previously executed, average noninstitutional and average inpatient purchased care costs to establish the inpatient purchased care cost factor for each MTF and specialty. In step 4, this cost factor will then be multiplied by the expected leakage (RWPs) calculated in figure 2 and entered into Step 8 of figure 1 (BAT flow Chart) to establish the expected cost of leakage prior to beneficiary category mix consideration.

The expected cost of leakage will be multiplied by the percentage of Prime enrolled to the MTF from fiscal year 2001 direct care data in step 5. The percentage of direct care given to TRICARE Prime beneficiaries (enrolled to the MTF) will be multiplied by the expected cost of leakage. The estimated leakage cost of TRICARE Prime (enrolled to the MTF) will reflect expected total inpatient purchased care cost due to leakage.

Purchased care outpatient calculations will also begin by calculating the direct care beneficiary category mix. In step 1, the average purchased care cost per RVU for each MTF catchment area, specific to the medical specialty under consideration is established. Two data points from the M2 will be manipulated. Total purchased care outpatient costs for the fiscal year will be divided by total RVUs to establish the average cost per RVU. Outpatient purchased care claims allow a more reasonable comparison since both purchased care claims and direct care data indicate provider specialty. Outpatient purchased care claims specific to the specialties under study will be scrubbed. In step 2, the average cost per RVU will then be applied to the leakage factor established in the methodology from figure 2. Multiplying these two elements will produce the expected cost of outpatient leakage prior to patient beneficiary category mix consideration.

In step 3, the expected cost of outpatient leakage will be multiplied by the percentage of TRICARE Prime (enrolled to the MTF) patients seeking care in the direct care setting will be multiplied by the expected cost of outpatient leakage. The TRICARE Prime network cost estimate in step 4 is utilized to estimate the outpatient purchased care cost for each MTF under consideration, specific to the medical specialty under consideration.

The total cost of sending potential physicians from the MTFs under consideration will be calculated in step 10 of figure 1. Airfare and per diem costs are locally stored on Excel tables. The per diem rate will be multiplied by the number of expected days for each backfill/augmentation tasking.

The cost factors for purchased care, airfare, and per diem will all be summed in step 11 to estimate the total expected cost per MTF and paint to a complete picture. The BAT will then consider qualitative input from MTF commanders and leadership. Command issues beyond financial factors are considered in step 12; an MTF obtaining relief from GPRMC will be removed from further consideration. The BAT will use a binary variable for command issues; one if yes (relief obtained), zero if otherwise. The final roster of backfill MTFs will be arrayed against one another in step 13. GPRMC leadership will have every evaluated data point throughout the BAT process as background information to facilitate closer inspection of assumptions and calculation if desired.

Model and Data Test

A test run of the model and data validated the methodology and data sources. Appendix E details the data test. A real world tasking from fiscal year 2001 for a 61H (Family Practice Physician) was used. The tasking requested a 61H be sent to Reynolds Army Community Hospital in Ft. Sill, Oklahoma for 78 days. Historical taskings from ARTS do not allow identification of specific physicians at each of the MTFs during the time when the tasking was being analyzed for possible support. For the test run an AOC commonly assigned to all MTFs within GPRMC was used. An assumption for the test run was that each of the MTFs could conceivably provide a backfill 61H. Data gathered during the collection period will allow full knowledge of physician assignments. Physician specific evaluation of PERSTEMPO days was notional as well since actual physicians were unable to be identified after the fact. However, in reality, physicians will be evaluated for PERSTEMPO management after taking the potential tasking into consideration.

The model then attempted to match the requisite AOC with any contract physicians. GPRMC employs both General Surgeons and Physician Assistants with traveling clauses. However, the BAT currently does not evaluate Physician Assistant taskings. The

BAT then established an estimated amount of leakage in RVUs for each of the MTFs. This was accomplished by normalizing the monthly leakage estimates already established to one day and then exploding the resulting one-day leakage value out for the duration of the potential tasking.

This new leakage rate was then applied to the average purchased care cost per RVU for a Family Physician claim, specific to each catchment area. In the instance of some MTFs, there was no expected leakage cost due to the estimation that these facilities would produce enough surge capacity to absorb the additional workload per available FTE.

The estimated purchased care claim impact was then decremented by the historical percentage of TRICARE Prime patients seen by Family Physicians at each MTF. The new product reflected the estimated percentage of purchased care claims that will be produced by TRICARE Prime patients.

Per Diem rates for each potential tasking are obtained from a locally stored database. An assumption was made that tasked physicians will be able to obtain government quarters. Government quarters at Ft. Sill run $35 a night and the meal rate was $28 a day. Airfare costs are negotiated annually and are stored locally for use in the BAT. The costs expressed as cash outflows were then summed to establish a total estimated cost per MTF for providing a backfill 61H to Reynolds Army

Community Hospital for 78 days.

The test run determined that allowing the expected leakage to the MCSC at Ft. Sill would be the least costly option when purchased care, per diem and travel costs were all taken into account. Ft. Sill's estimated leakage cost was $3438. However, there would not be any additional costs to the region for airfare and per diem. Many of the MTFs experienced substantially lower estimated leakage costs, but were excluded when travel and per diem costs pushed the total estimated tasking costs higher. Qualitative evaluation of commander's issues was notional since the tasking occurred in the past. Real world use of the BAT will require input from MTF leadership to fully utilize this aspect of the BAT.

Human error is clearly a danger throughout the BAT process. Workload coding, clinical available, and cost allocations all require human interface. As a result, data validity and reliability are open to evaluation. The validity and reliability of the BAT rests squarely on the validity and reliability of the data and assumptions needed to complete the study. Quality review by GPRMC data analysts familiar with MTF specific data have observed the data and feel the BAT is reasonably free of data errors. Additionally, RVU and RWP values per available FTE's were compared to existing productivity reports using only visits and procedures and there the data appears accurate (Burma Barfield, Personal Communication, February 25, 2003). It is assumed that MTFs submit accurate and timely data to TMA and subscribe to data quality management guidelines utilized in the MHS. The BAT process estimates four distinct values. It seeks to quantify productivity, surge capacity, leakage, and the cost of leakage to the network.

Productivity measures were developed from MEPRS for direct care. However, the MEPRS data have some shortcomings. In 1994, the Institute for Data Analysis conducted a study that determined the MEPRS data has several shortcomings. The report indicated MEPRS had elements missing that make it difficult to compare direct care costs to purchased care costs. The validity of the MEPRS information lies in the technique used to tease the information out. GPRMC Budget analysts intricately familiar with the quirks of MEPRS conducted the data pulls to ensure appropriate data were captured.

MEPRS was also the source for available FTEs. MEPRS analysts at GPRMC and MTFs indicated that physician time in the clinic is exaggerated (Burma Barfield, personal communication, October 11, 2002). Often providers will enter "crazy 8s", indicating they are available eight hours a day, for five days. A recent unpublished study indicated that available clinic time is often reported by exception, leading to possible incorrect availability and productivity figures (Bonnichsen et. al., 2002).

Workload credit was a reasonably strong point for GPRMC. Recent trends obtained from the Patient Administration System and Biostatics Activity (PASBA) indicates only negligible problems with outpatient workload and none with inpatient workload (Data Quality for AMEDD Success, 2003).

Results

Evaluation of backfill taskings for this paper occurred during the data collection period of 1 January 2003 through 31 March 2003. However, worldwide events occurred that seriously affected the frequency of taskings and the environment in which they occurred. The Global War of Terrorism, Operation Enduring Freedom and Operation Iraqi Freedom all placed unprecedented strains on GPRMC and the MHS as a whole. Consequently, extraordinary demands were placed on commanders and MTF staffs throughout the region. Providers in every facility were called upon to join their wartime units. GPRMC was hit unusually hard due to our large geographic area of responsibility. GPRMC supports over 1/3 of the Army stationed in the continental United States. Individual Mobilization Augmentees (IMAs) were brought on Active Duty to help replace deployed physicians throughout the region. Individuals assigned to reserve medical units commonly referred to as Troop Program Unit (TPU) personnel were activated as well. The BAT was designed to be a decision support tool capable of assisting in backfill decisions under normal working conditions (peace time). Yet, as has been discussed previously, the past few months have been anything but normal.

IMA and TPU personnel arrived at MTFs concurrent with PROFIS loses. Subsequent tasking requests often occurred at MTFs with temporarily assigned TPU and IMA personnel present. The result was a mingling of providers. The goal of this research was to do subsequent analysis of actual taskings to evaluate predictions and estimates. The confluence of these wartime factors required sampling of AOCs to be accomplished. Evaluating every taskings was an unachievable goal as a result of the mingling of TPU, IMA, and backfill missions throughout the region. The wartime footing made it difficult to find taskings that occurred clear of the confounding effects of TPU and IMA personnel. However, the 98 taskings, which occurred for the AOCs under study, revealed several backfill and PROFIS taskings that occurred without IMA or TPU personnel involvement. This allowed an evaluation that reasonably mimicked a normal peacetime situation in those instances.

Another byproduct of the Global War of Terrorism was the elimination of high PERSTEMPO Per Diem. PERSTEMPO data was not available for evaluation during the test period. However, the model was developed with a place holder for PERSTEMPO data. According to GPRMC’s PROFIS Manager, Mr. Clyde Harris, PERSCOM, the Army proponent for PERSTEMPO data, removed the website prior to the test period. Security issues with the page in conjunction with the suspension of high PERSTEMPO Per Diem payments resulted in the site's temporary closure. It was unclear whether this data point would be available for use in the BAT process in the future (Clyde Harris, Personal Communication, April 3, 2003).

The lack of specific individual PERTEMPO data negated the need to list each physician separately for use in the BAT process. Instead, the total numbers of physicians available for the tasking at each MTF were listed. Available physicians listed by the ARTS database included physicians carrying the AOCs under study as a secondary AOC. Lost productivity in the BAT was based on average available FTEs. There was no way to quantify how much time, if any, specific providers worked in their secondary AOCs. Accordingly, these physicians had to be removed from the available list.

Table 6 displays the results from the evaluation of current taskings.

Table 6. Comparison of Results

Tasking	AOC	Original Selection	BAT Selection
PROFIS (Operation Iraqi Freedom)	60P (Pediatrician)	Ft. Carson (EACH)	Ft. Carson (EACH)
Backfill to Ft. Riley (IACH)	61F (Internist)	BAMC	Ft. Sill (RACH)
PROFIS (NTC Rotation)	61H (Family Practice)	Ft. Leonard Wood (GLWACH)	Ft. Leonard Wood (GLWACH)
PROFIS (Operation Iraqi Freedom)	61J (General Surgeon	Ft. Huachuca (RWBACH)	Ft. Huachuca (RWBACH)
Backfill to Ft. Bliss (WBAMC)	61M (Orthopedic Surgeon)	Ft. Hood (DACH)	Ft. Bliss (WBAMC)

Taskings ranged from long deployments to short rotations to the National Training Center in Ft. Irwin, California. The test illustrated that a more sophisticated approach to the backfill decision could result in lower costs throughout the region. A detailed discussion of the underlying principles and specifics of each AOC's evaluation follows in the Discussion section of this paper.

Taskings for 2001 varied widely and required screening to identify useable data points. Table 7 displays those AOCs that passed screening.

Table 7. Fiscal year 2001 Regional Taskings That Passed Screening

Medical Specialty	Raw Number of Taskings	Percentage of overall Physician Taskings
Pediatrician	32	4%
Internist	27	4%
Family Physician	61	8%
General Surgeon	53	7%
Orthopedic Surgeon	27	4%

Screening criteria were developed in conjunction with Major Tim Edman, Chief of Managed Care for GPRMC. Tasking data initially included enlisted taskings for a total of 1008 taskings in 2001. Enlisted taskings were excluded to focus on the high cost area of physician services. Taskings from enlisted MOSs accounted for only 28% of all FY 2001 taskings, leaving 72% of all FY 01 taskings or 728 as officer taskings. Additionally, officer AOCs that produced less than 4% (36 of the 46 total AOCs) of the overall taskings were excluded as well. The leadership at GPRMC wished to focus on high volume AOCs; although conceivably this could result in overlooking high cost low volume specialties.

The resulting list consisted of 10 provider specialties. However, five were removed after review. Radiologists were removed due to the region's use of Tele-radiology. GPRMC is able to transfer workload at seven of the ten MTFs throughout the region. Efforts are in place to expand tele-radiology into all treatment facilities, negating the effectiveness of further cost analysis for this specialty. It is expected that Tele-radiology will do away with the need to routinely backfill Radiologists within the region.

Two nursing specialties were excluded as well. Clinical Nurse Specialists (66H) were removed because of an inability to establish where in the MTF each worked and their impact on a given service. Without this information, the cost relationship could not be established. Operating Nurses (66E) were screened out because nursing staffs serve in a support role, enabling surgery. Nurse Anesthesiologists and Anesthesiologists were screened out for similar reasons. Establishing the extent to which any degradation in direct care or increases in network costs is clearly associated with nursing or Anesthesia service losses cannot be accomplished with out much higher data granularity and analysis.

Use of the BAT was limited to those taskings requiring no less than one week of support. Research for this project has consistently indicated that MTFs are able to ramp up and handle short-term losses through command directed surge techniques. Estimation of leakage and surge is difficult and attempting to identify them in such a short period is beyond the capability of the BAT and the supporting data sources.

The BAT process was a financial estimation tool at its core and as such required a fair amount of financial and workload analysis. Table 8 displays the RVU’s per FTE used in the BAT process.

Table 8. Relative Value Units (RVUs) Per Available FTE

Facility	Pediatrician	Internist	Family Practice	General Surgeon	Ortho Surgeon
BAMC	26.26	35.24	15.90	80.49	68.42
WBAMC	15.66	31.06	19.90	16.46	20.15
DACH	23.19	32.74	23.82	22.15	26.87
GRP 1 AVG	20.19	32.84	21.19	30.22	32.45
GLWACH	31.96	14.23	10.66	34.78	21.21
BJACH	30.76	18.53	25.02	29.56	30.50
IACH	17.58	19.01	26.44	18.74	35.38
RACH	25.74	35.95	34.13	27.17	28.71
EACH	27.86	22.37	17.09	26.74	45.77
GRP 2 AVG	27.34	21.73	22.73	26.56	32.17
RWBAHC	33.96	56.88	34.57	27.94	25.66
MAHC	42.73	30.70	69.21	38.65	42.00
GRP 3 AVG	37.28	47.24	63.17	32.58	31.69

RVU’s per available FTE were critical in making relative comparisons between MTFs concerning productivity and cost comparisons. It was clear that some facilities produced substantially higher RVU’s per available FTE than even those sister facilities within peer groupings. For example, Orthopedic Surgeons at BAMC and EACH both demonstrated much higher RVUs per available FTE than contemporary facilities within their respective groups.

RVUs for direct care and purchased care were pulled using provider specialty codes. For direct care though, it was necessary to search down to the 3rd level MEPRS Codes that most likely contained physician workload. According to Burma Barfield, Senior MEPRS Analyst for GPRMC, searching every 3rd level MEPRS code work area without restriction would overload the system and fail to produce the desired data (Burma Barfield, Personal Communication, March 15, 2003). This study applied a strict standard to the definition of who was producing the desired workload. The BAT sought to quantify the productivity of specific types of physicians. For example, there may have been pediatric work being accomplished by other than pediatricians. However, the core of the question at hand was what did a pediatrician produce, not what pediatric workload was produced.

Identifying a reasonably sound way to capture both RWP and purchased care costs for General Surgeons and Orthopedic Surgeons proved challenging. Purchased care claims for inpatient work cannot be pulled by provider specialty. Use of MDC codes mentioned previously provided a reasonable approximation of functional areas and met the needs of the BAT. Again, the data wasn’t as clean as one would like, but research is often hindered by the suitability of the data available for analysis.

Surge and leakage calculations were also critical to the BAT. Table 9 identifies the estimated surge and leakage in either RVUs or RWPs for each of the MTFs based on a month of demand and productivity.

Table 9. Estimated Surge or Leakage

Facility	Pediatrician	Internists	Family Practice	General Surgeon RVU/RWP	Orthopedic Surgeon RVU/RWP
BAMC	-18.38	-24.67	38.33	-41.05/0.05	-34.90/-0.05
WBAMC	45.03	-15.68	-6.26	48.63/-1.63	64.17/-1.47
DACH	-48.85	-22.56	-16.67	13.63/-1.54	8.42/-0.96
GLWACH	-22.38	14.56	101.01	-17.74/-0.34	81.40/-0.20
BJACH	-21.53	-5.19	-17.51	-15.07/-1.29	41.21/-0.39
IACH	0.67	-11.05	-18.51	4.71/-0.73	26.19/-0.63
RACH	-14.84	-25.17	-23.89	-13.86/0.39	21.86/-0.13
EACH	-20.75	-15.66	-29.05	-13.64/-1.90	91.45/-0.65
RWBAHC	-20.80	-39.82	-20.34	-12.43/NA	-8.60/NA
MAHC	-29.81	-14.81	-48.45	-19.71/NA	-21.42/NA

Several facilities were expected to have excess capacity and thus no leakage. For example, Family Practice Physicians at GLWACH demonstrated excess capacity beyond that of any other MTF.

Both outpatient and inpatient purchased care claims, seen in both Table 10 and Table 11, were collected for use in the BAT.

Table 10. Average Purchased Care Outpatient Costs per RVU

Facility	General Surgery	Family Practice	Internal Medicine	Orthopedic Surgery	Pediatrics
BAMC	$48	$67	$145	$65	$72
EACH	$80	$60	$169	$70	$73
DACH	$51	$74	$73	$63	$67
RWBAHC	$65	$64	$71	$74	$72
MAHC	$54	$69	$125	$72	$78
GLWACH	$59	$68	$127	$65	$73
BJACH	$61	$68	$69	$61	$84
IACH	$58	$48	$220	$69	$75
RACH	$52	$68	$103	$68	$71
WBAMC	$61	$67	$85	$77	$58

Table 11. Average Inpatient Purchased Care Costs per RWP

Facility	General Surgery	Orthopedic Surgery
BAMC	$3,475	$3,466
EACH	$4,130	$3,655
DACH	$3,361	$3,488
GLWACH	$4,289	$3,353
BJACH	$2,808	$3,275
IACH	$4,426	$3,724
RACH	$3,175	$2,995
WBAMC	$4,890	$4,356

Outpatient claims were the easier of the two due to the ability to associate physician specialties with claims. However, inpatient claims were again difficult and required use of the MDC as a proxy. Internal medicine outpatient claims were especially varied. For example, BAMC and EACH both reflected average claims per RVU well above those from DACH and RWBAHC.

Development of inpatient purchased care claims required a closer look at the data. The initial claims reflected episodes where claims were paid without any RWP. Discussions with TMA revealed that certain types of inpatient care did not receive RWP calculations. The list was voluminous, but the major functional areas revolved around mental health care and skilled nursing care. Those functional areas as well as others clearly were beyond the scope of the specialties under study and were removed.

Inpatient claims used in the BAT included both institutional charges (hospital fees) and noninstitutional charges (professional fees). The method by which the MHS stored its claims data again clouded the picture. Noninstitutional claims for inpatient care included not only professional fees for the physician, but also costs for ambulance transportation, consulting fees, and other non-physician fees (Jack Shircel, Personal Communication, February 2, 2003). The result was an acknowledgement that the noninstitutional costs for the BAT were a rough estimate and some error was inherent in the data.

Discussion

Each of the taskings analyzed for this paper elucidated different facets of this project. Each analysis provided insight into the multifaceted components that make analyzing the backfill question such a challenge. As a result, each tasking will be discussed in detail to demonstrate these issues and highlight the key aspects that came out after successive tests were conducted. Figure 5 is the breakdown of the Pediatrician tasking used for the model test.

Tasking Type	PROFIS									
Specialty	Pediatrician (60P)									
Losing Unit	Evans ACH									
Mandays Lost	189									
MTF's ELIGIBLE TO PROVIDE BACKFILL	BAMC	WBAMC	HOOD	LEONARD WOOD	POLK	RILEY	SILL	CARSON	HUACHUCA	LEAVENWORTH
Number of Providers Avaiable for Tasking	47	6	10	2	3	3	4	3	NA	NA
Does PERSTEMPO Value For Each Physcian Exceed PERSTEMPO Rule	NO	NO	NO	NO	NO	NO	NO	NO	NA	NA
*PERSTEMPO is NOT available for use at this time. Site does not meet security requirements. Unknown at this time when site will again be available.										
Does Specialty Match Contract Physcians With Travel Clauses?	NO	NO	NO	NO	NO	NO	NO	NO	NA	NA
MTF's At Risk To Provide Backfill Following Initial Screening	BAMC	WBAMC	HOOD	LEONARD WOOD	POLK	RILEY	SILL	CARSON	HUACHUCA	LEAVENWORTH
Duration of Backfill Mission	189 Days	189 Days	189 Days	189 Days	189 Days	189 Days	189 Days	189 Days	NA	NA
Monthly Leakage Estimate (RVU'S)	-18.38	45.03	-48.85	-22.38	-21.53	0.67	-14.84	-20.75	NA	NA
Leakage Estimate (RVU's) for Backfill Mission	-115.82	283.69	-307.73	-140.96	-135.65	4.25	-93.52	-130.71	NA	NA
Purchased Care Average Cost Per RVU by Catchment Area	$ 72	$ 58	$ 67	$ 73	$ 84	$ 75	$ 71	$ 73	NA	NA
Estimated Raw Purchased Care Financial Impact of Selecting Facility to Provide Backfill Physcian (CASH OUTFLOW)	$ (8,339)	NONE	$(20,618)	$ (10,290)	$(11,394)	NONE	$ (6,640)	$ (9,542)	NA	NA
MTF Historical MTF-Prime Enrolled Population	70%	57%	69%	69%	61%	70%	78%	73%	NA	NA
Estimate Financial Exposure Due to MTF-Prime Enrolled Patients Seeking PC	$ (5,824)	NONE	$(14,141)	$ (7,081)	$ (6,994)	NONE	$ (5,147)	$ (6,985)	NA	NA
Airfare Costs for Potential Backfill Mission	$ (422)	$ (438)	$ (510)	$ (836)	$ (796)	$ (540)	$ (588)	[redacted]	NA	NA
Average Government Lodging Rate	$ 35	$ 35	$ 35	$ 35	$ 35	$ 35	$ 35	[redacted]		
Meals	$ 24	$ 24	$ 24	$ 24	$ 24	$ 24	$ 24	[redacted]		
Per Diem; Assuming Use of Government Lodging	$ (11,151)	$ (11,151)	$(11,151)	$ (11,151)	$(11,151)	$(11,151)	$(11,151)	[redacted]	NA	NA
TOTAL ESTIMATED COST FOR SUPPORTING BACKFILL MISSION	**$ (17,397)**	**$ (11,589)**	**$(25,802)**	**$ (19,068)**	**$(18,941)**	**$(11,691)**	**$(16,886)**	**$ (6,985)**	NA	NA
		BETTER				GOOD		BEST		

Figure 5. Pediatrician Tasking

The Pediatrician tasking (60P) was a PROFIS tasking in support of Operation Iraqi Freedom. The tasking took a physician away from EACH for over six months. The BAT method evaluated whether it was preferable to provide a backfill physician from another GPRMC MTF or let the estimated leakage at EACH be taken care by the MCSC and subsequently paid for by the MTF. Again, the underlying financial assumption for all analysis in this paper and the BAT was the future use of revised financing and invoicing between the MTF and the MCSC. The BAT seeks to coalesce numerous divergent data points to make financial estimations. Assumptions throughout the BAT were necessary to place parameters on the problem and begin work.

Perhaps the most notable aspect of the BAT process was the estimation of leakage and excess capacity. This aspect of analysis was troublesome and proved elusive. Available FTEs and RVUs both presented problems during the development of the BAT. RVUs are directly impacted by proper coding. While the MHS is making great strides to improve coding, much remains to be accomplished.

In the model results, calculations indicate that WBAMC had the capacity to produce over 45 RVUs above and beyond predicted demand. In model results both WBAMC and IACH are predicted to experience excess capacity during this potential tasking period. The other MTFs in the region were expected to experience leakage. Of note was DACH that was predicted to lose over $20,000 for the 189 days.

The resulting estimates determined that it would be preferable from a financial aspect to allow the expected leakage at EACH to occur. This was true even though other facilities were expected to experience more costly leakage. However, when the known costs of TDY were added in, EACH became the best choice due to the lack of any travel costs for that particular decision. Yet, there may have been a command issue that precluded using the best recommendation by the BAT. In that case the BAT identified the Good, Better, and Best choices from a purely financial aspect.

The next tasking evaluated was from BAMC. This was a backfill tasking for an Internist (61F) to replace another physician called away on a PROFIS mission at RACH. Figure 6 displays the entire breakdown of the 61F tasking.

Tasking Type	PROFIS									
Specialty	Internal Medicine (61F)									
Losing Unit	BAMC									
Mandays Lost	18									
MTF's ELIGIBLE TO PROVIDE BACKFILL	**BAMC**	**WBAMC**	**HOOD**	**LEONARD WOOD**	**POLK**	**RILEY**	**SILL**	**CARSON**	**HUACHUCA**	**LEAVENWORTH**
Number of Providers Avaiable for Tasking	42	15	3	3	3	0	1	3	NA	1
Does PERSTEMPO Value For Each Physcian Exceed PERSTEMPO Rule	NO	NO	NO	NO	NO	NO	NO	NO	NA	NA
***PERSTEMPO is NOT available for use at this time. Site does not meet security requirements. Unknown at this time when site will again be available.**										
Does Specialty Match Contract Physcians With Travel Clauses?	NO	NO	NO	NO	NO	NO	NO	NO	NA	NO
MTF's At Risk To Provide Backfill Following Initial Screening	**BAMC**	**WBAMC**	**HOOD**	**LEONARD WOOD**	**POLK**	**RILEY**	**SILL**	**CARSON**	**HUACHUCA**	**LEAVENWORTH**
Duration of Backfill Mission	18 Days	18 Days	18 Days	18 Days	18 Days	18 Days	18 Days	18 Days	NA	18 Days
Monthly Leakage Estimate (RVU'S)	-24.67	-15.68	-22.56	14.56	-5.19	-11.05	-25.17	-15.66	NA	-14.81
Leakage Estimate (RVU's) for Backfill Mission	-14.80	-9.41	-13.54	8.73	-3.11	-6.63	-15.10	-9.39	NA	-8.89
Purchased Care Average Cost Per RVU by Catchment Area	$ 145	$ 85	$ 73	$ 127	$ 69	$ 220	$ 103	$ 169	NA	$ 125
Estimated Raw Purchased Care Financial Impact of Selecting Facility to Provide Backfill Physcian (CASH OUTFLOW)	$ (2,146)	$ (799)	$ (988)	$ 1,109	$ (215)	$ (1,459)	$ (1,555)	$ (1,588)	NA	$ (1,111)
MTF Historical MTF-Prime Enrolled Population	70%	57%	69%	69%	61%	70%	78%	73%	76%	79%
Estimate Financial Exposure Due to MTF-Prime Enrolled Patients Seeking PC	$ (1,499)	$ (457)	$ (678)	$ 763	$ (132)	$ (1,026)	$ (1,206)	$ (1,162)	NA	$ (878)
Airfare Costs for Potential Backfill Mission	$ (428)	$ (628)	$ (398)	$ (1,186)	$ (560)	$ (818)	[redacted]	$ (588)	NA	$ (574)
Average Government Lodging Rate	$ 35	$ 35	$ 35	$ 35	$ 35	$ 35	[redacted]	$ 35	$ 35	$ 35
Meals	$ 26	$ 26	$ 26	$ 26	$ 26	$ 26	[redacted]	$ 26	NA	$ 26
Per Diem; Assuming Use of Government Lodging	$ (1,098)	$ (1,098)	$ (1,098)	$ (1,098)	$ (1,098)	$ (1,098)	[redacted]	$ (1,098)	NA	$ (1,098)
TOTAL ESTIMATED COST FOR SUPPORTING BACKFILL MISSION	**$ (3,025)**	**$ (1,726)**	**$ (2,174)**	**$ (2,284)**	**$ (1,790)**	**$ (1,916)**	**$ (1,206)**	**$ (2,848)**	NA	**$ (2,550)**
		BETTER				GOOD	BEST			

Figure 6. Internist Tasking

Most notable amongst the information gleaned from evaluating this tasking was the apparent disconnect between the ARTS personnel data and the data pulled from the M2 concerning RWBAHC historical workload and productivity. Clearly there was historical Internist workload, but the ARTS did not reflect any assigned 61Fs. ARTS obtained the assigned personnel directly from the Army's Standard Installation/Division Personnel System (SIDPERS) which contains very current assignment information. Without a reasonable way of validating SIDPERS assignment data, the BAT used ARTS data as its sole source for total assigned information.

Had the BAT been utilized during the evaluation of the tasking request, an Internist may not have been pulled from BAMC. The presumed need for a backfill was incorrect based on estimates by the BAT. The BAT estimated that the cost of leakage for RACH would have been the least expensive option in the entire region. However, BAMC was chosen to support the tasking. Doing so could have potentially cost BAMC in excess of $3,000 under revised financing and TNEX. Doing nothing was followed by backfilling from WBAMC and then IACH.

The next tasking analyzed was a Family Practice Physician (61H) tasking requiring a 61H to be sent from GLWACH in support of a 22 day NTC rotation. The BAT predicted what would be the best financial option for this mandatory physician loss. Figure 7 displays the analysis.

Tasking Type	PROFIS									
Specialty	Family Practice Physcian (61H)									
Losing Unit	Leonard Wood									
Mandays Lost	22									
MTF's ELIGIBLE TO PROVIDE BACKFILL	**BAMC**	**WBAMC**	**HOOD**	**LEONARD WOOD**	**POLK**	**RILEY**	**SILL**	**CARSON**	**HUACHUCA**	**LEAVENWORTH**
Number of Providers Avaiable for Tasking	6	3	30	8	11	6	14	10	2	4
Does PERSTEMPO Value For Each Physcian Exceed PERSTEMPO Rule	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
***PERSTEMPO is NOT available for use at this time. Site does not meet security requirements. Unknown at this time when site will again be available.**										
Does Specialty Match Contract Physcians With Travel Clauses?	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
MTF's At Risk To Provide Backfill Following Initial Screening	**BAMC**	**WBAMC**	**HOOD**	**LEONARD WOOD**	**POLK**	**RILEY**	**SILL**	**CARSON**	**HUACHUCA**	**LEAVENWORTH**
Duration of Backfill Mission	22 Days	22 Days	22 Days	22 Days	22 Days	22 Days	22 Days	22 Days	22 Days	22 Days
Monthly Leakage Estimate (RVU'S)	38.33	-6.26	-16.67	101.01	-17.51	-18.51	-23.89	29.05	-20.34	-48.45
Leakage Estimate (RVU's) for Backfill Mission	28.11	-4.59	-12.23	74.07	-12.84	-13.57	-17.52	21.30	-14.92	-35.53
Purchased Care Average Cost Per RVU by Catchment Area	$ 67	$ 67	$ 74	$ 68	$ 68	$ 48	$ 68	$ 60	$ 64	$ 69
Estimated Raw Purchased Care Financial Impact of Selecting Facility to Provide Backfill Physcian (CASH OUTFLOW)	$ 1,883	$ (308)	$ (905)	$ 5,037	$ (873)	$ (651)	$ (1,191)	$ 1,278	$ (955)	$ (2,451)
MTF Historical MTF-Prime Enrolled Population	70%	57%	69%	69%	61%	70%	78%	73%	76%	79%
Estimate Financial Exposure Due to MTF-Prime Enrolled Patients Seeking PC	$ 1,315	$ (176)	$ (621)	NONE	$ (536)	$ (458)	$ (923)	$ 936	$ (726)	$ (1,937)
Airfare Costs for Potential Backfill Mission	$ (892)	$ (716)	$ (620)		$ (994)	$ (368)	$ (1,186)	$ (836)	$ (570)	$ (398)
Average Government Lodging Rate	$ 35	$ 35	$ 35		$ 35	$ 35	$ 35	$ 35	$ 35	$ 35
Meals	$ 20	$ 20	$ 20		$ 20	$ 20	$ 20	$ 20	$ 20	$ 20
Per Diem; Assuming Use of Government Lodging	$ (1,210)	$ (1,210)	$ (1,210)		$ (1,210)	$ (1,210)	$ (1,210)	$ (1,210)	$ (1,210)	$ (1,210)
TOTAL ESTIMATED COST FOR SUPPORTING BACKFILL MISSION	**$ (2,102)**	**$ (1,926)**	**$ (2,451)**	**NONE**	**$ (2,740)**	**$ (1,578)**	**$ (3,319)**	**$ (2,046)**	**$ (2,506)**	**$ (3,545)**
		GOOD		BEST		BETTER				

Figure 7. Family Practice Physician Tasking

The BAT recommended taking no action to backfill the temporary 61H loss at GLWHCH. This option was by far the best solution. GLWACH was expected to absorb any lost productivity through the effects of surging. This, in addition to requiring no travel costs made it the best recommendation. Notable in this analysis is the absence of facilities showing excess capacity during the potential loss. Finally, the BAT recommended either IACH or WBAMC if GLWACH was eliminated for command interest reasons.

General Surgeons (61J) and Orthopedic Surgeons (61M) were challenging in that the data sources available for inpatient purchased care claims made it difficult to match claims to provider specialties. Figure 8 illustrates the evaluation of a General Surgeon tasking.

Tasking Type	PROFIS									
Specialty	General Surgeon (61J)									
Losing Unit	Huachuca									
Mandays Lost	207									
MTF's ELIGIBLE TO PROVIDE BACKFILL	**BAMC**	**WBAMC**	**HOOD**	**LEONARD WOOD**	**POLK**	**RILEY**	**SILL**	**CARSON**	**HUACHUCA**	**LEAVENWORTH**
Number of Providers Avaiable for Tasking	21	23	5	1	1	2	2	4	1	1
Does PERSTEMPO Value For Each Physcian Exceed PERSTEMPO Rule	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
***PERSTEMPO is NOT available for use at this time. Site does not meet security requirements. Unknown at this time when site will again be available.**										
Does Specialty Match Contract Physcians With Travel Clauses?	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
Number of Gen Surgeons with Contract Physcians Added	23	23	5	1	1	2	2	4	1	1
MTF's At Risk To Provide Backfill Following Initial Screening	**BAMC**	**WBAMC**	**HOOD**	**LEONARD WOOD**	**POLK**	**RILEY**	**SILL**	**CARSON**	**HUACHUCA**	**LEAVENWORTH**
Duration of Backfill Mission	207 Days	207 Days	207 Days	207 Days	207 Days	207 Days	207 Days	207 Days	207 Days	207 Days
Monthly Leakage Estimate (RVU'S)	-41.05	48.63	13.63	-17.74	-15.07	4.71	-13.86	-13.64	-12.43	-19.71
Monthly Leakage Estimate (RWP'S)	0.05	-1.63	-1.54	-0.34	-1.29	-0.73	0.39	-1.90	NA	NA
Leakage Estimate (RVU's) for Backfill Mission	-283.26	335.55	94.03	-122.38	-104.02	32.52	-95.61	-94.09	-85.80	-135.99
Leakage Estimate (RWP'S) for Backfill Mission	0.33	-11.24	-10.63	-2.34	-8.88	-5.06	2.67	-13.09	NA	NA
Purchased Care Average Cost Per RVU by Catchment Area	$ 48	$ 61	$ 51	$ 59	$ 61	$ 58	$ 52	$ 60	$ 65	$ 54
Purchased Care Average Cost Per RWP by Catchment Area	$ 3,475	$ 4,890	$ 3,361	$ 4,289	$ 2,808	$ 4,426	$ 3,175	$ 4,130	NA	NA
Estimated Raw Purchased Care Financial Impact of Selecting Facility to Provide Backfill Physcian (CASH OUTFLOW)	$ (12,466)	$ (34,466)	$(30,933)	$ (17,254)	$(31,295)	$(20,529)	$ 3,514	$(59,712)	$ (5,577)	$ (7,344)
MTF Historical MTF-Prime Enrolled Population	70%	57%	69%	69%	61%	70%	78%	73%	76%	79%
Estimate Financial Exposure Due to MTF-Prime Enrolled Patients Seeking PC	$ (8,706)	$ (19,687)	$(21,215)	$ (11,873)	$(19,211)	$(14,431)	$ 2,724	$(43,711)	$ (4,239)	$ (5,802)
Airfare Costs for Potential Backfill Mission	$ (374)	$ (334)	$ (628)	$ (570)	$ (994)	$ (486)	$ (898)	$ (266)	[redacted]	$ (288)
Average Government Lodging Rate	$ 35	$ 35	$ 35	$ 35	$ 35	$ 35	$ 35	$ 35	[redacted]	$ 35
Meals	$ 18	$ 18	$ 18	$ 18	$ 18	$ 18	$ 18	$ 18	[redacted]	$ 18
Per Diem; Assuming Use of Government Lodging	$ (10,971)	$ (10,971)	$ (10,971)	$ (10,971)	$ (10,971)	$ (10,971)	$ (10,971)	$ (10,971)	[redacted]	$ (10,971)
TOTAL ESTIMATED COST FOR SUPPORTING BACKFILL MISSION	**$ (20,051)**	**$ (30,992)**	**$ (32,814)**	**$ (23,414)**	**$ (31,176)**	**$ (25,888)**	**$ (9,145)**	**$ (54,948)**	**$ (4,239)**	**$ (17,061)**
							BETTER		BEST	GOOD

Figure 8. General Surgeon Tasking

General Surgeons contracted through GPRMC were required to travel periodically in support of temporary physician losses. Currently only 2 are employed and homestead at BAMC. As a result, BAMC’s available number of General Surgeons increased by two during evaluation. The results seen in Figure 7 were for a General Surgeon (61J) to deploy in support of Operation Enduring Freedom (Afghanistan Operations) for 207 days, a rather lengthy and expensive proposition for an MTF commander under TNEX.

Generally, all MTFs were expected to experience both outpatient visit and inpatient procedure leakage as a result of losing a 61J. However, WBAMC, DACH, and BJACH all were expected to lose in the neighborhood of $20,000 each to the network, a sizeable figure for any budget to absorb. Final calculations for all MTFs revealed RWBAHC was best suited financially to handle the loss. Many MTFs were expected to lose over $30,000 in support of this tasking. However, this evaluation is a good example of why the BAT is a decision support tool, not a final product. Although RWBAHC was best suited financially, RWBAHC was also listed as having only one 61J. Loss of this single physician could have many unwanted effects.

RWBAHC like MAHC conducted their outpatient visits at the MTF and did the procedures in a civilian facility. No inpatient procedures were accomplished at the MTF. The potential loss of this provider could idle numerous staff in excess of six months. This decision could also jeopardize existing agreements with the

MCSC or other local healthcare organizations. Additionally, continuity of care and patient expectations needed to be considered. Clearly their were second and third order effects that needed to be evaluated. This was the exact reason for the command interest portion in the BAT; it allows for qualitative issues to be considered in combination with quantitative data.

The final tasking evaluated was for an Orthopedic Surgeon (61M). The tasking analysis can be seen below in Figure 9.

Tasking Type	PROFIS									
Specialty	Orthopedic Surgeon (61M)									
Losing Unit	Darnall									
Mandays Lost	174									
MTF's ELIGIBLE TO PROVIDE BACKFILL	**BAMC**	**WBAMC**	**HOOD**	**LEONARD WOOD**	**POLK**	**RILEY**	**SILL**	**CARSON**	**HUACHUCA**	**LEAVENWORTH**
Number of Providers Avaiable for Tasking	30	24	4	3	1	2	1	3	1	1
Does PERSTEMPO Value For Each Physcian Exceed PERSTEMPO Rule	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
***PERSTEMPO is NOT available for use at this time. Site does not meet security requirements. Unknown at this time when site will again be available.**										
Does Specialty Match Contract Physcians With Travel Clauses?	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
MTF's At Risk To Provide Backfill Following Initial Screening	**BAMC**	**WBAMC**	**HOOD**	**LEONARD WOOD**	**POLK**	**RILEY**	**SILL**	**CARSON**	**HUACHUCA**	**LEAVENWORTH**
Duration of Backfill Mission	174 Days	174 Days	174 Days	174 Days	174 Days	174 Days	174 Days	174 Days	174 Days	174 Days
Monthly Leakage Estimate (RVU'S)	-34.89	64.17	8.42	81.39	41.21	26.19	21.86	91.45	-8.61	-21.42
Monthly Leakage Estimate (RWP'S)	-0.05	-1.47	-0.96	-0.20	-0.39	-0.63	-0.13	-0.65	NA	NA
Leakage Estimate (RVU's) for Backfill Mission	-202.38	372.19	48.84	472.08	239.00	151.91	126.76	530.42	-49.91	-124.23
Leakage Estimate (RWP'S) for Backfill Mission	-0.28	-8.52	-5.58	-1.18	-2.25	-3.63	-0.74	-3.75	NA	NA
Purchased Care Average Cost Per RVU by Catchment Area	$ 65	$ 77	$ 63	$ 65	$ 61	$ 69	$ 68	$ 70	$ 74	$ 72
Purchased Care Average Cost Per RWP by Catchment Area	$ 3,466	$ 4,356	$ 3,488	$ 3,353	$ 3,275	$ 3,724	$ 2,995	$ 3,655	NA	NA
Estimated Raw Purchased Care Financial Impact of Selecting Facility to Provide Backfill Physcian (CASH OUTFLOW)	$ (14,120)	$ (8,434)	$(16,377)	$ 26,731	$ 7,201	$ (3,032)	$ 6,391	$ 23,415	$ (3,693)	$ (8,944)
MTF Historical MTF-Prime Enrolled Population	70%	57%	69%	69%	61%	70%	78%	73%	76%	79%
Estimate Financial Exposure Due to MTF-Prime Enrolled Patients Seeking PC	$ (9,860)	$ (4,817)	$(11,232)	$ 18,394	$ 4,420	$ (2,131)	$ 4,954	$ 17,141	$ (2,807)	$ (7,066)
Airfare Costs for Potential Backfill Mission	$ (258)	[redacted]	$ (368)	$ (716)	$ (480)	$ (642)	$ (628)	$ (438)	$ (334)	$ (384)
Average Government Lodging Rate	$ 35		$ 35	$ 35	$ 35	$ 35	$ 35	$ 35	$ 35	$ 35
Meals	$ 20		$ 20	$ 20	$ 20	$ 20	$ 20	$ 20	$ 20	$ 20
Per Diem; Assuming Use of Government Lodging	$ (9,570)		$ (9,570)	$ (9,570)	$ (9,570)	$ (9,570)	$ (9,570)	$ (9,570)	$ (9,570)	$ (9,570)
TOTAL ESTIMATED COST FOR SUPPORTING BACKFILL MISSION	**$ (19,688)**	**$ (4,817)**	**$ (21,170)**	**$ (10,286)**	**$ (10,050)**	**$ (10,212)**	**$ (10,198)**	**$ (10,008)**	**$ (12,711)**	**$ (17,020)**
		BEST			GOOD			BETTER		

Figure 9. Orthopedic Surgeon Tasking

The original tasking took a 61M from DACH as a backfill physician at WBAMC. WBAMC had deployed an Orthopedic Surgeon in support of Operation Iraqi Freedom. Analysis of the backfill mission revealed that had GPRMC leadership utilized the BAT as a decision support tool, DACH may not have been chosen. DACH was not the best choice based solely on financial estimates. Allowing excess demand at WBAMC to leak to the network would have been the least costly option. This analysis was a good demonstration of the impact beneficiary category mix had on the final estimates. While WBAMC was estimated to have leaked nearly $8,500 worth of care, the historical portion of direct care obtained by TRICARE eligibles decremented that figure significantly. As a result, the final estimated leakage was reduced accordingly to slightly over $4,800. All things being equal, this reduced cost combined with the lack of travel costs made it the best option. Additionally, it's important to note that none of the MTFs were expected to absorb lost productivity. This could be especially important if GPRMC leadership chose to pull from MTFs such as BJACH, IACH, RACH and others with small populations of Orthopedic Surgeons.

Conclusion and Recommendations

The BAT process clearly provides GPRMC leadership with a nuanced and holistic approach to the backfill question, combining both quantitative and qualitative measures. It is recommended that GPRMC institute the BAT as part of the backfill decision-making process. Use should be maintained in the Managed Care Section of GPRMC due to the heavy data requirements. As the BAT becomes automated in the future, transition of the system could conceivably be made to the Operations Section. However, no staffing actions of any type have been made and a complete staffing study should be conducted to determine the suitability of final placement and functional responsibility.

While source data used for evaluation is subject to variability and human error, it is the data we have to use. More importantly, it is the data that MEDCOM leadership uses when making evaluations and decisions at the macro level. It is reasonable to expect that as available data are increasingly used by higher headquarters for resourcing and personnel decisions, the data will become more reflective of reality. The operational portion of the corporation owns the data and thus it is ours to improve upon. As a result, accuracy of data points such as available FTEs and RVUs may improve over time as well.

It appears that the least costly option for the backfill question is often to do nothing and allow the care to leak to the network. However, there are instances where this is not the case. It is here that the BAT can assist in making the most informed decision possible. While currently there is no discernible impact under financial rules, TNEX is going to change that.

Several issues lie on the horizon for AMEDD leadership. Compensation in the future for command directed temporary physician losses should be evaluated. The BAT estimates that often there will be some tangible costs associated with providing a backfill physician. Currently, there is no mechanism to compensate commanders that experience an increase in purchased care costs related to lost productivity. At issue is how we as a corporation accommodate that commander. The GPRMC TNEX transition team should study possible remedies as TNEX looms ever higher on the horizon.

The introduction of IMA and TPU providers throughout the region may have a distinct impact on future data pulls needed for the BAT and other clinical and financial analysis in the AMEDD. For instance, historical available FTEs may vary drastically in the future. Physicians deployed to MTFs do not have families and other distractions. They could conceivably work longer hours. This could skew the benchmark by which future physicians are measured. RVUs and RWPs could change as practice behaviors change with new temporary physicians. Physician scope of practice may impact patient acuity in future data pulls. Healthcare overall throughout the region is being impacted by the Global War on Terrorism. Tried and true measures may not be as dependable in the future when we do retrospective studies and measure performance. A study to determine the impact, if any, of the introduction of TPU and IMA physicians into the region's provider population may quantify the problem or declare it insignificant.

If the BAT is accepted and utilized by GPRMC, the historical data for fiscal year 2002 should be pulled and the BAT updated. An area for possible further study would be the feasibility of developing individual physician productivity profiles to be maintained as current as possible. The BAT uses average productivity at the specialty level. A more specific calculation for each physician could prove even more useful and individualize the impact.

Inclusion of the PERSTEMPO data should be accomplished as soon as possible. Future planning and backfill operations could be affected when PERSTEMPO rules are reinstated. The BAT would position the region well to react to any future impact by the imposition of PERSTEMPO rules again.

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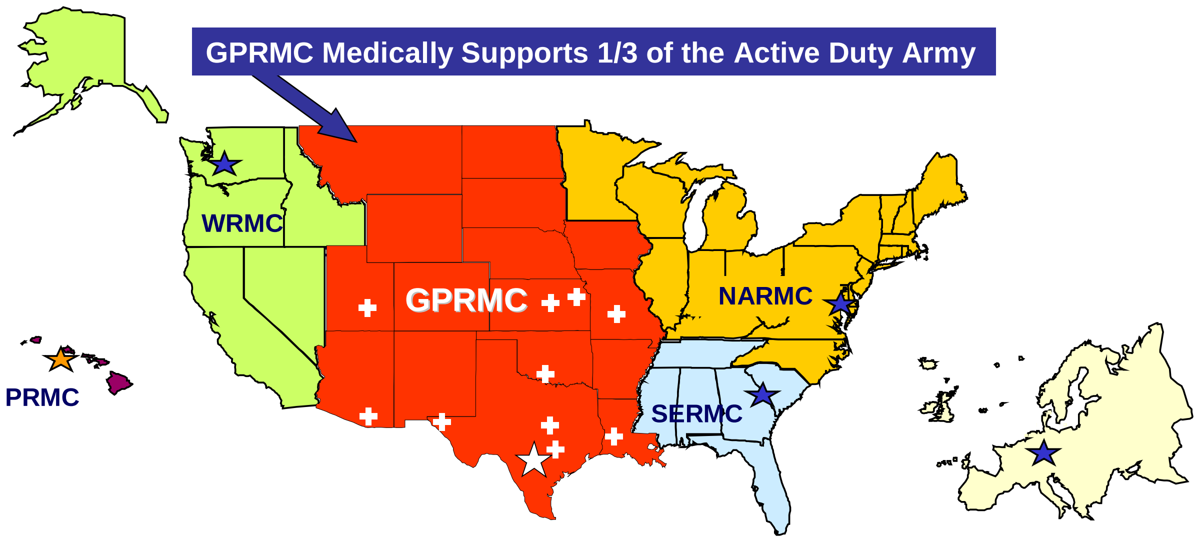
Appendix A

GPRMC Geographical Area of Responsibility

Regional Medical Commands (RMCs)

GPRMC Medically Supports 1/3 of the Active Duty Army

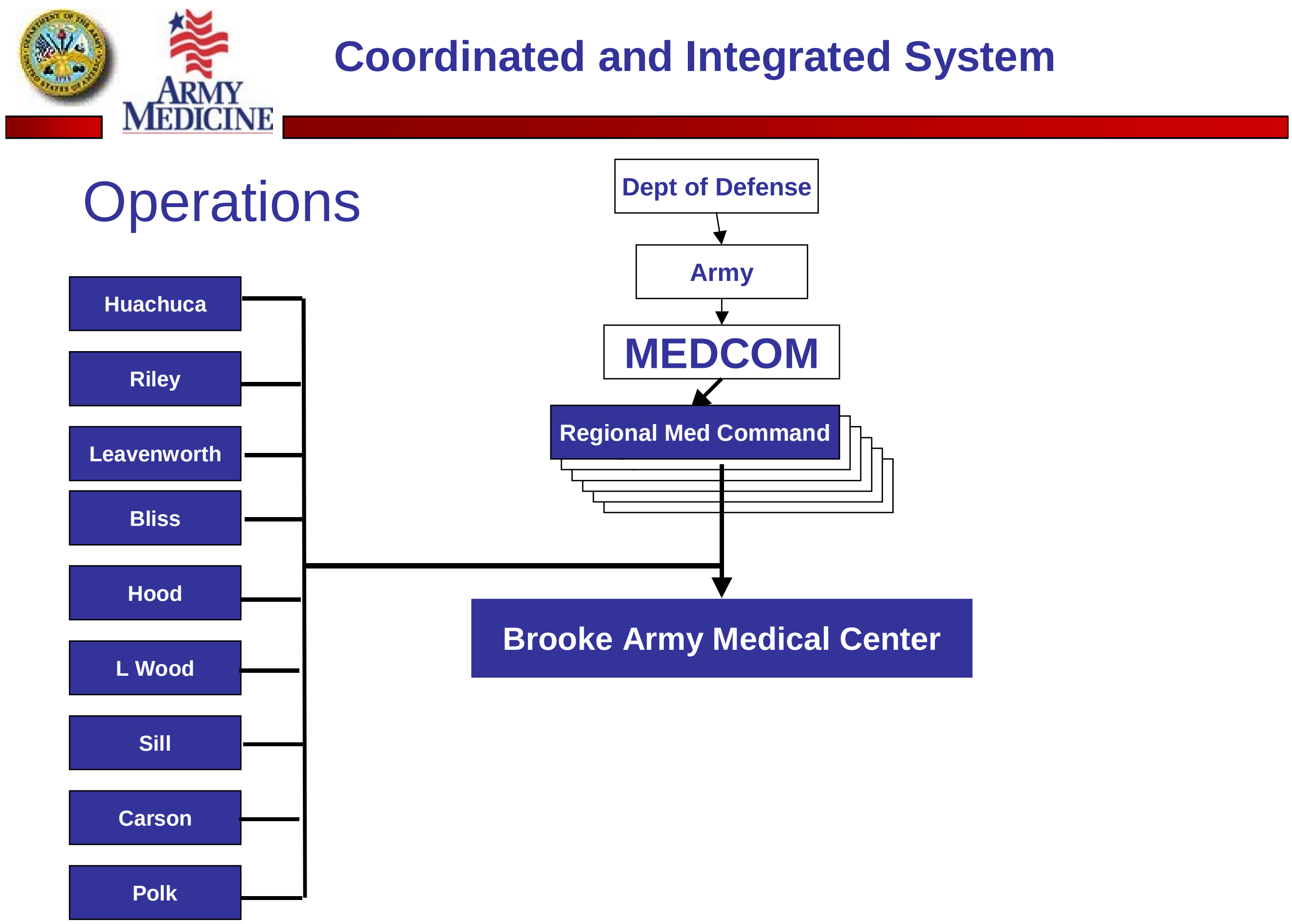


GREAT PLAINS RMC

BAMC (Ft Sam Houston)	WBAMC (Ft Bliss)
Ft Huachuca	Ft Leavenworth
Ft Hood	Ft Leonard Wood
Ft Polk	Ft Riley
Ft Sill	Ft Carson

Appendix B

MEDCOM Command Structure and Installation List



Appendix C

TRICARE MCSC Regions

Appendix D

Provider Loss Options Available to the MTF Commander

Internal Solutions

- Increased Productivity
- Reallocated Case Complexity
- Increased Appointment Wait Time
- Increased ER visits

External Military Solutions

- Backfills
  - Region
  - Reserves
- Borrowed Military Manpower
  - Formal
  - Informal

Contract Solutions

- Managed Care Support Contracts
  - Resource Sharing
  - Modifications
  - Existing Capacity
- Direct Care Contracts
  - New
  - Modifications
- Other Resource Sharing

Appendix E

Data Test Fiscal Year 2001 Taskings

Tasking Type	(P)AOC/MOS	Gaining Unit	Losing Unit	Deploy	Mission	Last Name	Mandays
PROFIS	61H	31ST CSH	MAHC	6/24/2001	ROVING SANDS	WURTH	8
PROFIS	61H	31ST CSH	RACH	6/3/2001	ROVING SANDS	DAVIS	10
PROFIS	61H	228TH CSH	RACH	7/23/2001	FTX	WILSON	5
AUGMENT	61H	ARCENT-SA	RACH	9/7/2000	ARCENT (SWA)	GOODSELL	78
BACKFILL	61H	H-MEDDAC	DACH	8/13/2000	EUROPE KFOR BACKFILL	CORCHADO-BARRETO	37
BACKFILL	61H	BUTZBACH HC	RACH	8/1/2000	EUROPE KFOR BACKFILL	THOMAS	37
PROFIS	61H	SPT SQDR 3ACR	EACH	2/29/2000	OJF/SFOR7	GRAY	15
PROFIS	61H	2/12 IN	EACH	9/11/2000	NTC	TRZEPKOWSKI	16
PROFIS	61H	1/68 AR	EACH	9/11/2000	NTC	KIRKLAND	16
PROFIS	61H	21ST CSH	DACH	10/15/2000	PHANTOM LIFE LINE (PLL200)	EDMONSON	7
PROFIS	61H	61ST ASMB	DACH	10/17/2000	PHANTOM LIFE LINE (PLL200)	MERCER	12
PROFIS	61H	115TH FH	BJACH	2/29/2000	OJF/SFOR7	CUCCINELLI	15
PROFIS	61H	115TH FH	BJACH	2/29/2000	OJF/SFOR7	LATZKA	15
PROFIS	61H	115TH FH	BJACH	2/29/2000	OJF/SFOR7	CARTER	15
PROFIS	61H	3BDE, 1ST AD	IACH	7/7/2000	OPERATION DESERT SPRING-ODS	PRESSON	114
PROFIS	61H	10TH CSH	IACH	10/9/2000	JRTC	LARSON	18
PROFIS	61H	115TH FH	RACH	2/29/2000	OJF/SFOR7	BLAIR	15
PROFIS	61H	10TH CSH	RACH	9/25/2000	JRTC	CRUM	31
PROFIS	61H	1/67TH AR	DACH	1/22/2001	FTX	INTHANOUSAY	15
PROFIS	61H	21ST CSH	DACH	2/4/2001	JRTC	EDMONSON	25
PROFIS	61H	1/67TH AR	DACH	3/27/2001	NTC	INTHANOUSAY	21
PROFIS	61H	566TH ASMC	GLWACH	3/8/2001	NTC	WELLS	51
PROFIS	61H	581ST ASMC	RACH	1/21/2001	FTX	THOMAS	5
PROFIS	61H	21ST CSH	RACH	2/4/2001	JRTC	SKALA	25
PROFIS	61H	2/5/ CAV	GLWACH	12/3/2000	OPERATION DESERT SPRING-ODS	PALACIO	141
PROFIS	61H	21ST CSH	DACH	6/3/2001	FTX	KINKADE	7
PROFIS	61H	228TH CSH	BAMC	4/9/2001	FTX	HUOTT	5
PROFIS	61H	215TH FSB	DACH	1/20/2001	NTC	ROBINSON	16
PROFIS	61H	1/16TH IN BN	RACH	2/15/2001	NTC	JOSEPH	20
AUGMENT	61H	1ST SPACE COMMAND	EACH	12/6/2000	SRP	MEYER	1
PROFIS	61H	1CAV-215FSB	GLWACH	4/2/2001	OPERATION DESERT SPRING-ODS	SHEPPARD	138
PROFIS	61H	27TH MSB	BAMC	8/9/2001	NTC	PASTOOR	36
PROFIS	61H	5/18 FA	RACH	2/23/2001	FTX	HOLMAN	38
PROFIS	61H	1/3 ACR	EACH	2/16/2001	FTX	NEWBURN	30
PROFIS	61H	228TH CSH	WBAMC	8/13/2001	FTX	YOST	5
BACKFILL	61H	ERMC	DACH	3/10/2001	OPERATION JOINT GUARDIAN-KFOR	EDMONDSON	113
PROFIS	61H	1/5 INF	DACH	8/13/2001	NTC	FRANCE	20
PROFIS	61H	15TH FSB	RACH	8/13/2001	NTC	ANGELO	20
PROFIS	61H	15TH FSB	GLWACH	8/13/2001	NTC	CONNER	20
PROFIS	61H	125TH FSB	GLWACH	9/16/2001	NTC	HAUGER	15
PROFIS	61H	2/2 ACR	BJACH	2/11/2001	NTC	SANTEE	27
PROFIS	61H	228TH CSH	MAHC	3/3/2001	FTX	LANDERS	5
PROFIS	61H	115TH FH	BJACH	5/14/2001	FTX	SHUMAN	5
PROFIS	61H	WG2NAA	EACH	4/20/2001	NTC	GRAY	26
PROFIS	61H	228TH CSH	RACH	8/13/2001	FTX	LOVINS	5
PROFIS	61H	228TH CSH	BAMC	8/13/2001	FTX	UNSER	5
PROFIS	61H	228TH CSH	BAMC	8/13/2001	FTX	BRAGA	5

Appendix F

Major Diagnostic Categories

Major Diagnostic Categories	
Code	**Description**
00	Unknown
01	Diseases and Disorders of the Nervous System
02	Diseases and Disorders of the Eye
03	Diseases and Disorders of the Ear, Nose, Mouth, and Throat
04	Diseases and Disorders of the Respiratory System
05	Diseases and Disorders of the Circulatory System
06	Diseases and Disorders of the Digestive System
07	Diseases and Disorders of the Hepatobiliary System and Pancreas
08	Diseases and Disorders of the Musculoskeletal System and Connective Tissue
09	Diseases and Disorders of the Skin, Subcutaneous Tissue and Breast
10	Endocrine, Nutritional and Metabolic Diseases and Disorders
11	Diseases and Disorders of the Kidney and Urinary Tract
12	Diseases and Disorders of the Male Reproductive System
13	Diseases and Disorders of the Female Reproductive System
14	Pregnancy, Childbirth, and the Puerperium
15	Newborns and Other Neonates with Conditions Originating in Perinatal Period
16	Diseases and Disorders of the Blood, Blood Forming Organs, Immunological Disorders
17	Myeloproliferative Diseases and Disorders, Poorly Differentiated Neoplasm
18	Infectious and Parasitic Diseases, Systemic or Unspecified Sites
19	Mental Diseases and Disorders
20	Alcohol/Drug Use and Alcohol/Drug Induced Organic Mental Disorders
21	Injuries, Poisonings and Toxic Effects of Drugs
22	Burns
23	Factors Influencing Health Status and Other Contacts with Health Services
24	Multiple Significant Trauma
25	Human Immunodeficiency Virus Infections

Appendix G

Model and Data Test

Tasking Type	Augmentation									
Specialty	Family Practice									
Losing Unit	Reynolds ACH									
Mandays Lost	78 days									
MTF's ELIGIBLE TO PROVIDE BACKFILL	**BAMC**	**WBAMC**	**HOOD**	**LEONARD WOOD**	**POLK**	**RILEY**	**SILL**	**CARSON**	**HUACHUCA**	**LEAVENWORTH**
***By name rosters are not available for historical backfill taskings; individual data points for test run are notional**										
	CPT Jones	CPT Smith	CPT Shircel	MAJ Santiago	CPT Edman	CPT Hallmark	MAJ Stackle	MAJ Cooper	MAJ Swofford	CPT Love
Does PERSTEMPO Value For Each Physcian Exceed	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
***PERSTEMPO is sepcific to each individual and is notional for this test run**										
Does Specialty Match Contract Physcians With Travel Clauses?	NO									
MTF's At Risk To Provide Backfill Following Initial	**BAMC**	**WBAMC**	**HOOD**	**LEONARD WOOD**	**POLK**	**RILEY**	**SILL**	**CARSON**	**HUACHUCA**	**LEAVENWORTH**
Duration of Backfill Mission	78 Days	78 Days	78 Days	78 Days	78 Days	78 Days	78 Days	78 Days	78 Days	78 Days
Monthly Leakage Estimate (RVU'S)	38.33	-6.26	-16.67	101.01	-17.51	-18.51	-23.89	29.05	-20.34	-48.45
Leakage Estimate (RVU's) for Backfill Mission	99.66	-16.27	-43.35	262.63	-45.53	-48.12	-62.11	75.53	-52.89	-125.96
Purchased Care Average Cost Per RVU by Catchment Area	$ 68	$ 69	$ 75	$ 69	$ 77	$ 59	$ 71	$ 62	$ 81	$ 72
Estimated Raw Purchased Care Financial Impact of Selecting Facility to Provide Backfill Physcian (CASH OUTFLOW)	NONE	$ (1,126)	$ (3,251)	NONE	$ (3,497)	$ (2,818)	$ (4,435)	NONE	NONE	$ (9,021)
MTF Historical MTF-Prime Enrolled Population	70%	57%	69%	69%	61%	70%	78%	73%	76%	79%
Estimate Financial Exposure Due to MTF-Prime Enrolled Patients Seeking PC	NONE	$ (643)	$ (2,230)	NONE	$ (2,147)	$ (1,981)	$ (3,438)	NONE	NONE	$ (7,160)
Airfare Costs for Potential Backfill Missic	$ (428)	$ (628)	$ (398.00)	$ (1,186)	$ (560)	$ (832)		$ (588)	$ (898)	$ (574)
Per Diem ($63 a Day); Assuming Use of Government Lodging	$ (4,914)	$ (4,914)	$ (4,914)	$ (4,914)	$ (4,914)	$ (4,914)		$ (4,914)	$ (4,914)	$ (4,914)
TOTAL ESTIMATED COST FOR SUPPORTING BACKFILL	**$ (5,342)**	**$ (6,185)**	**$ (7,542)**	**$ (6,100)**	**$ (7,621)**	**$ (7,727)**	**$ (3,438)**	**$ (5,502)**	**$ (5,812)**	**$ (12,648)**
Least Costly MTF To Provide Backfill										